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COMMERCE, JUSTICE, SCIENCE, AND RELATED AGENCIES APPROPRIATIONS FOR 2009

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS
HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

SECOND SESSION

SUBCOMMITTEE ON COMMERCE, JUSTICE, SCIENCE, AND RELATED AGENCIES

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COMMERCE, JUSTICE, SCIENCE, AND RELATED AGENCIES APPROPRIATIONS FOR 2009

WEDNESDAY, MARCH 5, 2008.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

WITNESS

MICHAEL D. GRIFFIN, NASA ADMINISTRATOR

CHAIRMAN'S OPENING REMARKS

Mr. MOLLOHAN. Good afternoon, Dr. Griffin, and welcome before the Commerce, Justice, Science and Related Agencies Appropriations Subcommittee this afternoon to discuss the budget request for the National Aeronautics and Space Administration for fiscal year 2009.

As you know, there is a great deal of congressional interest in the portfolio of programs and activities that you oversee. So while I welcome you here this afternoon, the Committee looks forward to having you back again for a full day tomorrow.

In less than a year, this nation will have a new President and whether he or she is Republican or Democrat, that new President and we, the Congress, must develop a consensus on what NASA should be doing and identify the level of resources that we are prepared to commit to NASA.

Regrettably, since the enactment of the NASA Authorization Act of 2005, which established such a consensus and identified that resources need to meet that vision, funding recommended by this Administration has been too lean to meet that vision.

When coupled with other costs that NASA has had to absorb since 2005, such as the space shuttle's return to flight and the Hubble servicing mission, today's mismatch between NASA's tasks and responsibilities and its resources continue to grow.

The budget and its five-year rollout contain annual increases, barely, if at all, that keep pace with inflation. And even the budget from which these inflationary increases are calculated is thin in many areas.

For example, the budget contains no money for shuttle retirement and transition costs past 2010 despite assurances that these costs would be included in each of the last two budgets, leading one to conclude that other NASA programs will have to continue to absorb these costs.

The budget contains no funding for replacing the aging deep space network for which development costs are in excess of $8 billion over the next 20 years and is vital to support the very space missions that we fund today and will be in orbit just over the budgetary horizon.

The budget recognizes the gap in U.S. human access to space once the shuttle is retired in 2010, but does little to address it. The budget continues the perennial dance with Congress by cutting aeronautics research and development again this year by 25 percent.

While the budget initiates new Earth science missions consistent with direction by this Committee and recommended by the National Academies in their recent survey, it fails to provide new resources for them. It simply shifts money within the overall science program. Science eats its own.

The budget shorts the international Space Station's utilization and operations needs and erodes the very research used to justify the Space Station itself.

The budget reduces funds for education programs by over 20 percent, undermining the National Academies report that proposed broad recommendations to enhance K through 12 science and mathematics education and investment in STEM activities.

While these shortfalls are not insignificant, and I am particularly concerned that the funds necessary to address the budget's inadequacies may not materialize in this continuing protracted budget stalemate with this President, I am concerned that it is becoming nearly impossible to maintain an overall balanced portfolio in NASA in this budgetary climate. And I know that perhaps you agree with me in this regard.

And though your budget request for this year is $17.6 billion, which is a lot of money in any earthly world, you are cash strapped. The budget has been characterized as staying the course. It does not seem adequate anymore.

I know, too, that we do not have to convince you that investments in NASA's programs are critical to our nation's competitiveness, efficiency, and safety of our transportation system, our nation's preeminence in the aviation industry, and ultimately affect the quality of our life and of our planet. The stakes are high as is the challenge.

Welcome again, Mr. Administrator, and all those who you have with you.

And at this time, I would like to recognize the Ranking Member of the Subcommittee, Mr. Frelinghuysen.

RANKING MEMBER'S OPENING REMARKS

Mr. FRELINGHUYSEN. I thank the Chairman, and I join the Chairman in welcoming you today before the Subcommittee to discuss your 2009 budget request.

As the Chairman stated, you are requesting 17.6 billion in new budget authority which represents an increase of 1.8 percent above the fiscal year 2008 level.

The requested increase is modest and you are attempting to balance a number of important missions. It is a significant challenge to maintain healthy funding for science and aeronautics while trying to adhere to the schedules that have been established with the retirement of the shuttle, the completion of the international Space Station, and the development of the Orion and Ares capabilities.

The budget for space and Earth science is flat. But within that level, you have prioritized funding for the top-ranked missions of the recent Earth science decadal survey.

The aeronautics research budget is again a significant reduction. The Committee heard testimony last week from GAO, extensive testimony on NASA's role in the next agenda initiative to modernize the nation's air traffic system. And I will have some questions about that NASA contribution to that effort in my time.

In exploration, you face perhaps your greatest management challenge in developing the new Orion, Ares vehicles on schedule and on budget. We hope you can bring us up to date with the status of these important efforts.

Last but not least, you have an enormous challenge in carrying out the remaining flight manifest for the shuttle through 2010 and to complete the assembly of the international Space Station.

We appreciate your dedication and the dedication of your team supporting you here today, both the public team and the private sector, in carrying out these important NASA missions.

I also appreciate the attention, and I am sure the Chairman does, to your dedicating so much time to the management of NASA and to fiscal accountability.

And I look forward to hearing your testimony today.

Thank you, Mr. Chairman.

Mr. MOLLOHAN. Dr. Griffin, we invite you to share your opening comments with us. Your written statement will be made a part of the record.

Before you begin with your comments, would you please either introduce or have those who are sitting at the table introduce themselves. And then when they speak, if they would identify themselves for the record.

ADMINISTRATOR GRIFFIN'S OPENING REMARKS

Dr. GRIFFIN. Yes, sir. Thank you for inviting us today. To my far left is Dr. Jaiwon Shin who runs Aeronautics Research Mission Directorate for NASA. Jai is formerly of the Glenn Research Center, but we have now captured him here at headquarters. To my immediate left is Mr. Bill Gerstenmaier who runs the Space Operations Mission Directorate. Broadly speaking, that includes the Space Shuttle, the International Space Station, and our Expendable Launch Vehicle fleet. Immediately to my right is Dr. Alan Stern who runs our Science Mission Directorate. Alan is a very well-known and very well-established principal investigator in the field of space and planetary science. We were fortunate to attract him to NASA. And to my far right is Doug Cooke, Deputy Associate Administrator for Exploration Systems Mission Directorate at NASA. The Associate Administrator, Rick Gilbrech, could not be here. He is ill. Doug, however, has been with NASA since the early Shuttle years, has worked Shuttle, Station and then beyond Earth orbit exploration programs since we have had them.

So I think you have the best that I can provide here at NASA today.

Mr. MOLLOHAN. Thank you, Dr. Griffin, and welcome everyone at the table. And if you would proceed.

Dr. GRIFFIN. Yes, sir. Thank you.

Mr. Chairman Mollohan, Ranking Member Frelinghuysen, thank you for having me here today to talk about the NASA program and to grant me the privilege of bringing my team. It is a good team.

You mentioned, sir, that we are coming up on a Presidential transition and we are. Of course, every two years, we have a Congressional transition. So transition is nothing new to NASA, but this one will be particularly significant. I would like to spend a few moments and review the bidding on why.

Give or take a few weeks and what I am about to say, five years ago, those who were sitting here and others of us who were asked to testify as private citizens to various hearings in Congress were reeling in the aftermath of the loss of Space Shuttle Columbia, trying to find out what went wrong, how it could have gone wrong, and what we would have to do to fix it.

Four years ago this spring, we were dealing with the output, the outcome of that accident and the output of the Columbia Accident Investigation Board led by Admiral Gehman which resulted in sweeping changes to how the Shuttle program is managed and what we do with the Shuttle.

It also resulted in the development of a new civil space policy by this President and this Administration which was put before this Congress four years ago.

Three years ago, I had been nominated as Administrator to come back to the Agency and head up this new effort and to continue our existing efforts. Two years ago, this Congress had just approved by a very strong bipartisan vote the new civil space policy that the President put forth. The basic terms of that policy were that we would finish the construction of the International Space Station, keeping our commitments to our partners. We would use the Space Shuttle to do so, after which we would retire the Shuttle in 2010, recognizing the words of the Columbia Accident Investigation Board that space flight is difficult, dangerous, expensive, but for the United States, it is strategic and it should be continued. But if it were to be continued, it needed to have goals worthy of the costs and the risks and the difficulty. So we set about with that new space policy a plan to return to the Moon and eventually go on to Mars and other destinations.

A year ago, barely a year into that new program as authorized by the Congress, we were dealing with the effects of a year-long Continuing Resolution to our program which immediately caused us to stretch out dates that we had prior commitments to.

Today, I come to you in a year in which we have a Presidential transition, the first one now in eight years, and the need that we have at NASA, the greatest need that we have at NASA is for stability.

We do not change space policy very often. Prior to the loss of Shuttle Columbia and the resultant changes proposed by the President, the United States had not changed the basic direction of the civil space program for 35 years. Following Apollo, the direction of the civil space program had been to build the Shuttle, fly the Shuttle, and develop, deploy and utilize the Space Station. We had nothing beyond that for 35 years.

Now we have a plan that takes us out again beyond low Earth orbit for human exploration and robotic exploration. That is the best plan that has been provided to NASA by a United States Congress in over 40 years. What we need now in the wake of the very wrenching transitions we have had over the past several years and in view of the transition yet to come, what we need is stability and a sense of purpose.

The Columbia Accident Investigation Board (CAIB) commented that the United States space program had moved forward for more than 30 years without a guiding vision. Now we have it and it is the right vision.

The Columbia Accident Investigation Board commented that if we were to replace the aging Shuttle, and they recommended that we do, that the approach could only be successful if our purpose was sustained and the funds were committed throughout the lifetime of the program. That, too, is covered in our budget and I ask you for that stability.

So I will close by commenting that in my opinion what we at NASA need and what the nation needs from NASA now and from our Oversight Committees and Appropriations Committees who support us, what we need is the constancy of purpose recommended by the Columbia Accident Investigation Board. That will be a legacy that the crew of Shuttle Columbia could honor.

Thank you.

[Written statement of Michael D. Griffin, Administrator, National Aeronautics and Space Administration follows:]

HOLD FOR RELEASE
UNTIL PRESENTED
BY WITNESS
March 5, 2008

Statement of
Michael D. Griffin
Administrator
National Aeronautics and Space Administration

before the

Subcommittee on Commerce, Justice, Science, and Related Agencies
Committee on Appropriations
House of Representatives

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to appear today to discuss the President's FY 2009 budget request for NASA. The President's budget request for NASA is $17.6 billion, a 2.9 percent increase over the net budget authority enacted for 2008, along with a steady, five-year runout commensurate with inflation. This increase demonstrates the President's commitment to funding the balanced priorities he set forth for the Agency in space exploration, Earth and space science, and aeronautics research. We are making steady progress in achieving these goals. I ask for your continued support as you consider the President's FY 2009 budget request for NASA.

When I testified before this Subcommittee last year, I spoke about the Administration's balanced priorities for our Nation's civil space and aeronautics research goals as set forth by the Congress and the President. NASA's mandate is clear, and NASA's authorizing legislation, as well as the level of funding appropriated to NASA in FY 2008, tell me that Congress broadly endorses the balanced set of programs the Agency has put forward in this era of limited budget growth.

I have said this in other forums, but it warrants repeating here: at present funding levels, NASA's budget is sufficient to support a variety of excellent space programs, but it cannot support all of the potential programs we could execute. No plan or level of funding can fully satisfy all the many constituencies we have. Balanced choices must be made. But they cannot continually be remade and revisited if there is to be steady progress toward our common, defined objectives.

As the Columbia Accident Investigation Board noted, and as stakeholders acknowledged in ensuing policy debates, it would have been far worse to continue with the prior lack of strategic direction for human space flight, to continue dithering and debating and inevitably widening the gap between Shuttle retirement and the availability of new systems. Until and unless the Congress provides new and different authorization for NASA, the law of the land specifies that we will complete the International Space Station, retire the Shuttle, design and build a new spaceflight architecture, return to the Moon in a manner supporting a "sustained human presence," and prepare the way to Mars.

We are doing those things as quickly and efficiently as possible. System designs for the early elements have been completed, contracts have been let, and consistently solid progress is being made with a minimum of unexpected difficulty. True, the progress might be slower than all of us would prefer, but applying resources in the right direction, irrespective of pace, is always productive -- and we are doing that. The Ares I Crew Launch Vehicle and the Orion Crew Exploration Vehicle, as they are presently taking form, are the building blocks for any American future beyond low-Earth orbit (LEO).

Given that this endeavor will be our first step beyond LEO for crewed spacecraft since 1972, I believe that bypassing the Moon to venture directly into deep space--a proposal some have suggested revisiting--poses unacceptable risk. Returning to the Moon and consolidating the gains to be made thereby will set us properly on the path toward Mars. I ask for your continued support and leadership as we progress toward achieving these worthy National objectives.

Before I highlight key elements of NASA's FY 2009 budget request, I would like to summarize NASA's initial FY 2008 Operating Plan, submitted to the Subcommittee on February 1, 2008. The initial Operating Plan provides aggregate funding of $17.3 billion, at the level of the President's FY 2008 request. Pursuant to the rescission of $192.5 million in NASA unobligated balances in the Consolidated Appropriations Act, 2008 (P.L. 110-161), aggregate funding in NASA's FY 2007 Operating Plan is reduced by $185.2 million, and prior year balances are reduced by $7.2 million. Implementation of direction in P.L. 110-161 has resulted in a total reduction of $620.9 million in planned NASA activities, consisting of the rescission of $192.5 million, offsets for programmatic augmentations totaling $345.2 million, and site-specific Congressional interest items totaling $83.2 million. Finally, in accordance with Congressional direction, NASA has established seven Agency appropriations accounts in the FY 2009 budget request. As a result, the budgets for NASA's programs and projects are requested in terms of direct costs, not the additional indirect costs associated with operating the Agency's field Centers, assuring safety and mission success, and Agency management and operations. The direct budgets will continue to reflect labor, travel, and procurement costs associated with each program and project. The indirect costs are now budgeted solely within the Cross Agency Support account, and not in the NASA programs and projects. We will strive to ensure that these changes are transparent to our stakeholders.

I am appreciative of the action by the Committees on Appropriations and Congress in providing regular FY 2008 appropriations for the Agency at the level of the President's request, including essentially full funding for the Orion, the Ares I, the Space Shuttle, and the International Space Station. This total FY 2008 appropriations level, with some adjustments within the total, will enable NASA to meet critical priorities in accordance with the direction from the Congress and the President.

Highlights of the NASA FY 2009 Budget Request

I am pleased to report that the FY 2009 budget represents a substantial step forward in responding to the recommendations of the National Research Council's (NRC) first decadal survey of Earth Science, released in January 2007. The five-year budget runout requests $910 million for priorities enumerated in the report. Funding will support development of two Decadal Survey new mission priorities -- the Soil Moisture Active/Passive (SMAP) mission scheduled to launch as early as 2012, and the Ice, Clouds, land Elevation Satellite II (ICESat II) scheduled to launch in 2015 – as well as formulation of three additional decadal survey missions.

Working closely with NOAA, we also are making significant progress toward restoring climate sensors that had been removed from the tri-agency National Polar-Orbiting Operational Environmental Satellite System (NPOESS) in 2006. The FY 2009 budget request of $74 million for NOAA supports the addition of a Clouds and the Earth's Radiant Energy System (CERES) instrument onto NASA's NPOESS Preparatory Project (NPP) satellite, set to launch in 2010; instrument development and ongoing analyses to identify a suitable satellite platform for hosting the Total Solar Irradiance Sensor (TSIS); and development of climate data records. These actions, which will be implemented through close coordination between NASA and NOAA, come in addition to the inclusion of the Ozone Mapping and Profiler Suite (OMPS)-Limb sensor on the NPP satellite that was announced earlier in 2007.

The Agency's FY 2009 budget request also reflects a number of exciting developments in the space sciences, including an increase in the number of new missions, a new initiative in lunar science and initiation of plans for high-priority missions in Astrophysics and Planetary Exploration. The FY 2009 request includes an increase of $344 million over five years for Lunar Science in order to better understand our Moon. NASA's Science Mission Directorate, with support from the Exploration Systems Mission Directorate, is developing two small lunar landers, and the Science Mission Directorate is initiating a series of new and exciting missions headed to the Moon over the next decade. Meanwhile, we are focusing our Mars program after 2013 on a Mars sample return mission to launch by 2020, and have identified funds to initiate development of an outer planets flagship mission to be selected in October of this year for launch by 2017. The budget also significantly increases Research and Analysis funds in the space sciences to gain better value from the missions we are flying, and so too, it increases the funding and, therefore, the flight rate of our suborbital rocket and balloon research programs in the space sciences.

Our Aeronautics Research portfolio is positioned to address the challenges facing the Next Generation Air Transportation System, while also developing world-class aeronautics expertise and capabilities. Research is aligned with the National Plan for Aeronautics Research and Development and Related Infrastructure, approved by the President in December 2007. In FY 2009, we will conduct a key test to advance our understanding of aircraft aging and durability, and develop algorithms to optimize the use of crowded airspace and airports. We will continue work on blended-wing-body aircraft, which may reduce fuel consumption and emissions, as well as aircraft noise. Additionally, NASA's Aeronautics Research Mission Directorate continues to strengthen partnerships with academia, industry, and other government agencies to accomplish its strategic goals.

NASA's commitment to its exploration objectives is clearly reflected in the FY 2009 budget request. As assembly of the Space Station nears completion, NASA will increasingly focus its efforts on continuing the development of the Orion Crew Exploration Vehicle and Ares I Crew Launch Vehicle. This budget request maintains Orion initial operational capability in March 2015, and full operational capability in FY 2016, though we are striving to bring this new vehicle on line sooner. In FY 2008, we will see the completion of the formulation phase for major elements of the Constellation program; both Orion and Ares I will undergo their preliminary design reviews. We will conduct the first Ares ascent development flight test with the Ares I-X in the Spring of 2009, and we will continue to conduct research and develop and test technologies through the Advanced Capabilities Human Research and Exploration Technology Development Program. The Lunar Reconnaissance Orbiter (LRO)/Lunar Crater Observation Sensing Satellite (LCROSS), an important part of NASA's lunar exploration strategy, is on track for launch at the beginning of FY 2009. The Agency is also requesting $173 million to provide incentives for entrepreneurs—from big companies or small ones—to develop commercial transport capabilities to support the International Space Station. With more than $2.6 billion in NASA funds available over the next five years to purchase cargo and crew services to support Space Station operations, our objective and strong preference is to use these funds to purchase these services from American commercial companies wherever possible.

While I would prefer that the United States have domestic alternatives to purchasing crew transport services from Russia, I am glad that the Russians are our partners and have such capabilities, because the consequences if they were not available are far worse. If NASA astronauts were not onboard the Space Station, our National Laboratory in space simply would not survive. If there is no Space Station, there is no market for the commercial providers we are trying to help bring into existence, and our international partnership would simply fall apart. So, in order to keep these objectives viable, NASA may need to obtain additional crew and cargo transport services from our international partners if U.S. commercial services are not yet demonstrated and available.

In the area of Space Operations, NASA's FY 2009 budget request will allow us to continue to expand the Space Station, complete the supporting truss structure and solar arrays, and deliver the final component of the Japanese laboratory. This will round out the set of three space laboratories aboard the Station, with one each from the United States, Europe, and Japan. In addition, FY 2009 will mark another milestone for the International Space Station Program—for the first time, the Station will be able to support a full-time crew of six astronauts. With three major scientific facilities available to them, these larger crews will be busy as Station kicks off a new era in microgravity research aboard this National Laboratory in orbit. Critical to these achievements, the Space Shuttle is scheduled to fly five times in FY 2009. During FY 2009, NASA also plans to launch payloads on eight expendable launch vehicles. FY 2009 will also see the consolidation of the Deep Space, Near-Earth, and Space Communications networks into a unified Space Communications and Navigation (SCaN) architecture within the Space Operations Mission Directorate.

NASA is continuing to transition from the Space Shuttle to new Exploration systems, and will need a complement of critical tools and authorities necessary for the transformed Agency to execute its mission. This transition is the largest and most daunting since the end of the Apollo program and the beginning of the Space Shuttle program. It dictates that we obtain the authorities needed to ensure sufficient support in the future. We hope to discuss the details of these legislative requests with Members of Congress in the weeks ahead.

The remainder of my testimony outlines the FY 2009 budget request for NASA in greater detail.

Science Mission Directorate

In 2007, NASA successfully launched four new orbital and planetary science missions (THEMIS, AIM, Phoenix, and Dawn), almost 20 suborbital science missions, and two major airborne Earth science campaigns. This past year also saw the first test flights of the Stratospheric Observatory for Infrared Astronomy (SOFIA) 747 airborne infrared observatory, as well as the provision of rapid-response airborne remote sensing aid to the California wildfire emergencies. In addition, 2007 was a year of remarkable scientific discovery about the Earth, the Sun, the planets and the universe. For example, data from the Ice, Clouds, and land Elevation Satellite (ICESat), the Gravity Recovery and Climate Experiment (GRACE), and other satellites have provided dramatic new insights on ice sheet changes in Greenland and Antarctica. The Solar TErrestrial RElations Observatory (STEREO) satellites (A and B) have provided the first three dimensional images of the sun and the structures of the heliosphere. These new 3-D views, along with unprecedented observations from Hinode (Solar-B), NASA's Time History of Events and Macroscale Interactions during Substorms (THEMIS) mission, and the Aeronomy of Ice in the Mesosphere (AIM) satellite are revolutionizing knowledge of the variable Sun and its interactions with the Earth. Also, the Cassini spacecraft radar imagery of Titan revealed large lakes of methane in Titan's North polar region, indicating a hydrological cycle. Finally, a new map provides the best evidence to date that normal matter, largely in the form of galaxies, accumulates along the densest concentrations of dark matter. Mapping dark matter's distribution in space and time is fundamental to understanding how galaxies grew and clustered over billions of years.

NASA's FY 2009 budget request provides $4.44 billion for the Agency's Science portfolio to study the Earth, our Sun and its heliosphere, our solar system, and the Universe. This funding enables NASA's Science Mission Directorate (SMD) to start major new missions, to increase research and analysis funding, and to operate and provide ground support for 55 operating science missions, including 13 Earth science mission extensions. It provides support for over 3,000 current operating research and analysis grants, while continuing to develop high priority missions in Earth Science, Heliophysics, Planetary Science and Astrophysics, consistent with the priorities established by the NRC's decadal surveys.

The FY 2009 budget request for Earth Science provides $1.37 billion to help us better understand the Earth's atmosphere, lithosphere, hydrosphere, cryosphere, and biosphere as a single connected system. In addition to 14 operating missions, the request includes funding for seven missions in development. The Landsat Data Continuity Mission and Ocean Surface Topography Mission (to launch in 2008) continue the decades-long time series of land cover change and ocean surface height data, respectively. Glory targets the impact of aerosols on climate. The National Polar-orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) paves the way for the future national weather system and continues essential measurements from the NASA Earth Observing System (EOS), Aquarius, and the Orbiting Carbon Observatory (OCO), set to launch in 2008. Aquarius and OCO will make the first-ever global measurements of ocean surface salinity and atmospheric carbon dioxide, respectively. The request specifically increases funding for OCO and the Aquarius missions to maintain development schedules. The Global Precipitation Measurement (GPM) mission will extend the rainfall measurements made by the Tropical Rainfall Measurement Mission (TRMM) to the global scale. The request retains the GPM core mission launch readiness date. With respect to Glory, the development estimate included in the FY 2009 request represents cost growth of more than 30 percent from NASA's baseline development estimate, which, under the terms for Major Program Activity Reports under P.L. 109-555, will require explicit Congressional authorization in the next 18 months to continue.

The budget request responds to the Earth Science Decadal Survey by establishing a funding wedge of $910.0 million over the budget runout to initiate five new earth Decadal Survey missions for launch by 2020, while continuing to implement seven precursor missions for launch between 2008 and 2013. NASA will continue to contribute to the President's Climate Change Research Initiative by collecting data sets and developing predictive capabilities that will enable advanced assessments of the causes and consequences of global climate change.

The Heliophysics budget request of $577.3 million will support missions to understand the Sun and its effects on Earth, the solar system, and the space environmental conditions that explorers will experience, and to demonstrate technologies that can improve future operational systems. The request increases budgets for Sounding Rockets, Research Range, and Research and Analysis to achieve a more robust level of small payload opportunities. In addition to supporting 16 currently operational missions, the request supports the Interstellar Boundary Explorer (IBEX) mission focused on the detection of the very edge of our solar system and the Coupled ion-Neural Dynamics Investigation (CINDI) "Mission of Opportunity" that will provide new insight on the Earth's ionospheric structure, both of which are planned for launch in 2008. In early FY 2009, the Solar Dynamics Observatory (SDO) to study the Sun's magnetic field is planned for launch, and the Geospace Radiation Belt Storm Probes (RBSP) mission will begin development. RBSP will improve our understanding of how the Earth's radiation belts are formed and how solar output modifies the Earth's Van Allen radiation belts. Further, the five-year budget funds a new Solar Probe mission, which has long been sought by the U.S. scientific community and is recommended highly in the most recent Heliophysics decadal survey.

The Planetary Science budget provides $1.33 billion to advance scientific knowledge of the solar system, search for evidence of life, and to prepare for human exploration. The budget supports an array of eight currently operating spacecraft and rovers traveling to or now studying Mercury, Mars, the Asteroid Belt, Saturn, and Pluto, in addition to a series of instrument missions of opportunity. The budget request augments Lunar Science to include a series of small robotic lunar satellites to begin development in FY 2009 and initiates an outer planets flagship mission, planned for launch in 2016 or 2017. The request includes continuation of funds for all five of NASA's operating Mars missions, the development of a

U.S. LEADERSHIP IN CIVIL SPACE EXPLORATION

Mr. MOLLOHAN. Thank you, Dr. Griffin.

Speaking in the broadest terms, how does the vision and its funding address the competition we are now experiencing from other countries that are getting into and becoming increasingly sophisticated in civil space?

Dr. GRIFFIN. It provides us an opportunity to partner with our peers and I think it provides a threat to our leadership. The United States for decades has been the leader in all aspects of civil space exploration. It is a position that in part for the generations alive today defines what it is to be an American. It has gone without question that the United States reached the Moon and other nations had not, that the United States leads the coalition to build the Internatonal Space Station, others cannot, that the United States built the Hubble Space Telescope, others did not, and so on for many other missions.

Today we are in a position where we must retire the Space Shuttle and because there will be a gap in human space flight capability between the retirement of the Shuttle and the deployment of Ares and Orion, its successors, we will face a four-and-a-half year gap at this point where in order to access the Space Station that we have built, we must depend upon Russian transportation systems for crew resupply and we must depend upon European and Japanese cargo transport, which is part of our existing barter agreements with them, so that is not a new relationship, and we must depend upon commercial resupply capability which has not yet been developed.

Now, I am among the most forward leaning that you will talk to in my optimism that such commercial transport will develop, but it is still a bet. It is not a position that I would willingly see the United States occupy vis-a-vis our strategic competitors in the world and, yet, it is a position in which we find ourselves.

Mr. MOLLOHAN. Well, given the current schedules and current funding levels, do we risk having our preeminence in space overtaken by other countries and, if so, does it matter?

Dr. GRIFFIN. I will answer the second question first. I do not intend to be in any way parochial or jingoistic, but I am an American and I will always be. I think that our country should strive to be preeminent in all things upon which the eyes of the world rest and space is one of those things. Space and space exploration is an activity that virtually every nation in the advanced world begins to undertake as soon as it is able. Most of them want to partner with us. They will not want to partner with us if we are not the leader. So I think it does matter. Clearly we have been a leader. Clearly when we are in a position where we are buying transportation from others to and from the Space Station that we took a leadership role in building, others will ask whether the United States is still a leader. I do not know what answers they will come up with. But during the period of time when we are not flying in space, Russia and China will be able to. And that bothers me.

I have to add, for the second part of it, that I am glad that Russia is there as a Space Station partner to provide such transport because if they were not, we would not have a means of supplying crew or rotating crew to and from the Space Station and we would not be able to capitalize on the investment that we have made. So while I dislike the situation in which we find ourselves, it is preferable to some others I can envision.

Mr. MOLLOHAN. Mr. Frelinghuysen, I think I am going to go vote and I will be back in time for you to go vote and while you proceed with questions.

Is that all right?

Mr. FRELINGHUYSEN. Yes.

Mr. MOLLOHAN. Okay.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Thank you, sir.

RUSSIAN AND CHINESE RELATIONSHIP WITH NASA

Mr. FRELINGHUYSEN [presiding]. Well, thank you for your testimony. Sort of keeping in line with the Chairman's questions and your response, the whole notion that we would be beholden to the Russians to get where we need to get, could you expand on that?

Obviously, we have a good working relationship with the Russians. It seems to me, and we have discussed this, that if the American people knew how beholden we would be to the Russians, you would get a far greater public demand for greater investments in NASA than what we have.

The Chinese are to this lay person leap-frogging ahead. How would you characterize the Chinese program and does that represent a threat?

Dr. GRIFFIN. Let me answer again the second question first. I am very impressed with what China is accomplishing in human space flight. They are only the third nation to develop their own internal capabilities for conducting human spaceflight. I believe that they see it as I do, as a strategic matter for a great nation. I do not see it as a threat other than to our image of ourselves in the world. For other nations to be able to do profoundly difficult and daring things that we cannot do, in a period of time when we cannot do them, is not a position that the United States would wish to be in. I have been fairly clear about that. I think it has ramifications in the world of economics, in the world of soft power and I think we——

Mr. FRELINGHUYSEN. And military power.

Dr. GRIFFIN. It has implications for military power, and I think we ignore that at our peril. Now, with regard to Russia, I personally like the Russians that we work with on the Space Station program. I admire their capabilities and they have been good partners. We pay for that partnership and that is money which does not come back to American aerospace industry. But they have met their obligations.

Mr. FRELINGHUYSEN. But at some point in time, we are going to be inherently dependent on them.

Dr. GRIFFIN. We are and let me——

Mr. FRELINGHUYSEN [continuing]. For access?

Dr. GRIFFIN. Let me not embellish it.

Mr. FRELINGHUYSEN. Yes.

Dr. GRIFFIN. Let me not be rhetorical. Let me state specifically what our position is. After we retire the Shuttle in 2010, and until and unless we deploy the U.S. Orion crew exploration vehicle or until an as yet unknown commercial capability becomes available for a period that we estimate currently to be four-and-a-half years, if we wish to have U.S. crew onboard the Space Station, we will be purchasing those seats from Russia.

If we wish to meet our existing obligations to our European, Canadian, and Japanese partners to provide crew transportation for their astronauts, which is an obligation we assumed, if we wish to meet that obligation, we will be purchasing those seats from Russia between 2010 and 2015. Even into 2015, quite likely into 2016, we will be flying a new vehicle, whether it is commercial or whether it is government-built. Such a new vehicle cannot be initially counted on for crew rescue services and, yet, we must have crew rescue capability onboard the Space Station.

Today the proven crew rescue capability is the Russian Soyuz vehicle. So until we have sufficiently flight tested our own vehicle to know that it can loiter at the Space Station for six months at a time and be capable of safely returning crew to the Earth in the event of an emergency, we will continue to be dependent upon the Soyuz system. Those are the facts.

ADEQUATE FUNDING FOR NASA

Mr. FRELINGHUYSEN. It has become common, and I do believe it personally, to hear that NASA is not adequately funded to carry out its various missions or at least not carry them out well.

As you know, there was an effort last year to provide a billion dollars in emergency funding as belated compensation for the costs necessary to return the space shuttle to flight after the Columbia disaster.

You have clearly defined a set of tasks in front of you that you have described in detail in your testimony. Can you carry them out with the budget you have laid before us?

Dr. GRIFFIN. I believe that we can carry out the tasks which we have said we will do with the budget that the President has requested for NASA. The questions you have been asking so far are more in the vein of are we carrying out the right tasks, were we carrying out those tasks rapid enough. And on those matters, opinion may, of course, differ.

But subject to some of the constraints we have discussed, the four-and-a-half year gap and the purchase of Soyuz services and those things, I believe that we can carry out the program that the President has requested NASA to accomplish with the funding that he has allocated.

TRANSITION COST

Mr. FRELINGHUYSEN. One of the biggest uncertainties has to do with the transition cost as the shuttle program ends. I know we sort of indirectly commented on Presidential transition. Surely there are some good people that are, I assume, working overtime to prepare the next President with his or her portfolio, which certainly should include human space travel as a top priority.

Do you have an estimate of the total transition cost and are those costs included in the budget? When we had quite a go around the other day, as you are aware, with the Government Accountability Office, the view was that those costs were not adequately reflected in your projections.

Dr. GRIFFIN. Yes, sir. I understand. I will be direct. We disagree with the GAO on this matter. We do not wish to budget explicit values for transition costs at the present time because by so doing, we essentially lock in an expectation or an entitlement that those costs will be at least at that level. We have been assessing transition costs very carefully for the last two years and, every time we look at them and we continue to dig into the tail, they come down.

We will, as part of our planning and budgeting process this coming year, budget for transition costs, but we are aggressively keeping those costs as low as we can, precisely because of the point you just mentioned, that transitions costs, which are not funded by the Space Shuttle program become a lien on the rest of NASA.

Do you need to go vote, sir?

Mr. FRELINGHUYSEN. I sure do.

Dr. GRIFFIN. Let me withhold the rest of my answer——

Mr. FRELINGHUYSEN. Yes.

Dr. GRIFFIN [continuing]. Until you return.

Mr. FRELINGHUYSEN. No. But to some extent, you are dealing with those transition costs?

Dr. GRIFFIN. We absolutely are and they represent——

Mr. FRELINGHUYSEN. But they must be reflected somewhere. I understand that if you——

Dr. GRIFFIN [continuing]. They are a——

Mr. FRELINGHUYSEN [continuing]. Put a marker there, then you sort of raise certain expectations.

Dr. GRIFFIN. Yes, sir. They are a lien on the Constellation Program if it should be needed. For that reason, it is in our interest to keep them as low as possible. Now, I understand that you need to go vote.

Mr. FRELINGHUYSEN. I do.

Dr. GRIFFIN. I would be happy to resume when you return, sir.

Mr. FRELINGHUYSEN. So on the Chairman's behalf, we are going to have a brief recess. I apologize.

Dr. GRIFFIN. Yes, sir.

[Recess.]

Mr. MOLLOHAN [presiding]. Well, we are back.

Mr. Schiff.

CONGRESSMAN SCHIFF'S OPENING REMARKS

Mr. SCHIFF. Thank you, Mr. Chairman.

Mr. Administrator, thank you for being here. I appreciate your spending a couple days with us.

I had the wonderful experience last year for the first time to see a shuttle launch which was quite a phenomenal experience. I cannot imagine what it must be like to be sitting on top of that when that goes off and goes up, that is just amazing.

I wanted to at the outset just reiterate my strong support for NASA, for both the human space flight as well as the robotic exploration. I realize that we will have a potential gap in terms of our schedule on the manned space flight. We need to make that window obviously as short as possible.

But as I mentioned at these hearings last year, I view the NASA request as a floor and have supported and will continue to support additional funding for NASA. You have a very aggressive ambition at NASA which I applaud and I think we need to make sure the resources are there to follow through on that ambition.

I do not think we can afford to concede our leadership in either human or robotic space exploration. And I think my colleagues on both sides of the aisle share that view.

SPACE INTERFEROMETRY MISSION (SIM)

There are two issues I wanted to raise that I have some concern over and I know they will not come as any great surprise. One involves SIM. The other involves the Mars program.

The big concern with SIM is we want to make sure that the program has enough money next year to allow for real progress before the new mission starts in 2010. We worked to get funding for that, as you know, in the omnibus last year.

I am concerned that there is not a request, at least a direct request for SIM in the budget this year. Although I know there is some money in the other missions and data analysis for SIM.

But the Congress has strong support for this effort and I appreciate the work that your staff has done to work with us and try to find a model of SIM that is within our capacity to afford and to do and move forward with.

If you could in particular talk about the new money for SIM, JPL, I think, is going to need more than the $6.6 million to continue to have that ready to go, and I would like to work with you and our Chairman, our Committee members to try to augment that funding consistent with the agreement that we worked out on a new model for SIM. And I would love to have you share your thoughts and expectations on that.

Dr. GRIFFIN. Well, I will give you some top-level comments. I have Dr. Stern here who runs the Science Mission Directorate, and can provide some additional detail. We are, as you point out, this year looking at competing approaches for accomplishing the SIM mission, the task of finding planets around other stars. As we talked with you about it, when we feel that we have an appropriate approach to recommend that will accomplish the task and can be afforded, we will come back to the Congress and discus that with you. There is not a request in this year's budget for SIM. The Administration did not request funding for SIM. The Congress has appropriated funding for it and we will, of course, spend that money as the Congress has directed. Whether there will be an Administration request for SIM in a later year depends in part upon the outcome of the analysis that we perform this year. Alan, would you care to explain in a little more detail about the mission?

Dr. STERN. Sure. Absolutely.

Good afternoon. I would just like to tell you that within our——

Mr. MOLLOHAN. Identify yourself.

Dr. STERN. Sure. I am Alan Stern. I am the Associate Administrator for the Science Mission Directorate.

Mr. MOLLOHAN. Thank you, Doctor.

Dr. STERN. Yes, sir.

I wanted to assure you, Mr. Schiff, that within our Astrophysics Division, in fact, within the Science Mission Directorate, the search for Extra-solar Planets, exoplanets as they are called, is one of our highest priorities.

It has been ranked very highly by the National Academy in the Astrophysics decadal survey and we plan to continue to execute on that goal, including the next mission following Kepler, for which SIM is a candidate. We have put a great deal of resources into the development of that mission technology. It has gone very well. The challenge now for SIM, is for SIM to fit in the available budget wedge while all the other portions of the Astrophysics budget that are already underway are built. So, with the budget that has been provided by the Congress, we expect to be able to do that and make that determination this year or next year.

Mr. SCHIFF. You know, I would just say we have had this sort of tug of war over the last several years on SIM. SIM has been in your glide path. Many of us want it in a quicker glide path. On a bipartisan basis, we expressed that sentiment for the budget last year.

We have been working with you to accommodate and envision a more modest sized SIM that can be accommodated within the budget with all the other priorities that we have, and I want to continue to work with you all on that. I do not know what your time line is in terms of developing your broader policy of priorities in this area, but just looking at the course of this budget cycle, we would rather work with you in terms of shaping our appropriation in that area than work on it unilaterally.

So I would invite you to give us your thoughts as quickly as you can on the kind of resources you think you need to keep this sort of new SIM concept on track so that we do not have big gaps in this. I look forward to working with you on that.

MARS PROGRAM FUNDING

The second issue, because I know I do not have much time, at least in this round, and I will be following up on this in future rounds, is the Mars glide path has changed pretty dramatically from where it was last year in terms of the funding for Mars.

I would like to ask you, because I think this has been really a cornerstone of our exploration program and has generated so much public support for it, I support the goal of a sample return from Mars by 2020, but the drastic cut in the Mars budget does not seem consistent with congressional direction, the broad support of the scientific community, and public excitement about the Mars missions.

This is a drastic reduction from last year's five-year plan for no apparent reason. I would like to work with you both to restore the funding for this program and ensure that this good science is also funded.

If you could share your thoughts on what changed from last year to this year and how we can work together to try to restore that support for the Mars program.

Dr. STERN. Yes, sir. Administrator Griffin has asked me to take this question. So let me start by saying that the Mars program has been very successful and we are very proud of the results that we have obtained from it. We are looking forward to the Mars Science Laboratory (MSL) mission launching next year and a series of missions that we have planned and what you see in the budget request.

However, the Mars mission does reside within the Planetary Science Division. As you know, there is a decadal survey for planetary sciences that speak to the needs in planetary science for the inner planet, the outer planets, for Mars, for primitive bodies, and other aspects of the field. So there are a variety of competing needs.

At mid decade, which was just last year, the National Academy provided us with this report. This report was put together by a Committee chaired by one of my predecessors, Dr. Wesley Huntress. That report gives us grades, A's, B's, C's, and D's, for the different activities within the Planetary Science Division, grading them against the goals of the decadal survey.

Our Mars program received an A. Our outer planets program received a D. Our Research and Analysis program received a C. So what you see in the President's request consistent with this report card is an attempt to repair the major deficiencies of the program within the budget resources that are available.

Dr. GRIFFIN. I would add a comment that the Mars program, of course, has its own interest and own excitement, and it is funded today at a very high level because it is executing a flagship mission, the Mars Science Laboratory.

There then becomes an expectation, almost an entitlement, that funding will continue at the level necessary to support flagship and that cannot happen because within the overall Planetary Sciences Division, there are other communities who want flagships. Indeed, the National Research Council of the National Academy has recommended an outer planet flagship. We cannot conduct Mars at a flagship level and also do an outer planet flagship mission. So the budgets for the individual communities within Planetary Sciences have to go up and down and have to phase properly in order to stay within overall guidelines while accomplishing a varied set of goals. What we are really doing is returning the Mars program to its average funding level.

Mr. SCHIFF. If I could just interject because I know I am probably out of time already, but I understand all that is true. All that was true last year as well. But, nonetheless, the path that Mars was on in terms of its funding and support last year is drastically different than what is being proposed this year.

So my question, is, what changed in all that calculus from last year to this year that accounts for such a dramatic decrease in the Mars funding?

Dr. GRIFFIN. We have reformulated the strategy that we wish to use in exploring Mars as compared to our other obligations within science.

Mr. SCHIFF. What are those other obligations?

Dr. GRIFFIN. Some money has gone to Earth science.

Mr. SCHIFF. Mr. Chairman, I look forward to exploring this further during the hearing. Thank you.

NASA'S BUDGET REQUEST

Mr. MOLLOHAN. Doctor, you have got a lot of things on your plate. You have got the shuttle and the Space Station operations, development of new human space transportation system.

Your budget has to support aeronautics, space science and technology applications and these important activities and ambitious human lunar program will necessitate investment.

Your budget request, I think, had an increase of about 1.8 percent which does not even keep up with inflation. And it just does not seem to fit.

How do you sustain all that with that small an increase and would you not agree that that is inadequate?

Dr. GRIFFIN. I can only say that the President's budget is adequate for the goals that the President has asked us to accomplish. Over the years of the Bush Administration, the NASA budget has kept pace with inflation. In this one year, it takes a bit of a dip. But broadly speaking, we do keep pace with inflation. A free variable, of course, in your question is the time frame in which the accomplishments are completed. I think we have a very good portfolio of activity within NASA and I have been very pleased that whenever we have a discussion as with the one we just had with Mr. Schiff, it is not about the question of whether an activity is worth pursuing. Everyone that I work with here on Capitol Hill seems to think that what we are doing are good things and the questions are always about the relative priorities among good things and the pace at which good things can be accomplished. Clearly if more money were allocated, more things can be done or things can be done faster. But the budget submitted by the President is adequate to accomplish what he has asked us to accomplish in the time frame that we claim we can do it.

Mr. MOLLOHAN. Well, obviously it is not even a current services budget. Would you agree with that?

Dr. GRIFFIN. I am not sure what you mean by current——

Mr. MOLLOHAN. Well, it is not enough money to fund the activities that you are funding in 2008. It is not enough money to keep up with inflation.

Dr. GRIFFIN. It goes slightly below the inflationary level this year, yes, sir.

Mr. MOLLOHAN. Well, my point is, what adjustments are you making at NASA to accommodate that reality, that fact? What programs are being, I guess, not funded or stretched out?

Dr. GRIFFIN. Well, no program is not being funded or stretched out that was otherwise planned to be done because we have seen this small dip coming for a while and our programs have been planned accordingly. The biggest recent dip in our program was the Continuing Resolution that we got a year ago this time and we have managed to adjust our programs to fit that. In fact, the primary way that we adjusted our programmatic flow to meet the demands of the Continuing Resolution was that we slipped the delivery date for Ares and Orion, the Shuttle replacements, by six months. In general, with ongoing programs, that is what we have to do when for any reason there is a decrement in funding.

Mr. MOLLOHAN. And I guess the Mars program that you and Mr. Schiff were talking about is down $170 or so million. That is an adjustment you have made that was not——

Dr. GRIFFIN. That is true. That is a strategy adjustment we made since last year within Planetary Sciences. We have targeted money for an outer planet flagship. We have shifted other money to Earth science and the Mars program has a little bit less than it was once planned, but they would have——

Mr. MOLLOHAN. So that is an example of an adjustment you have made this year which you did not anticipate making last year?

Dr. GRIFFIN. That is true. We have a new Science Mission Director this year, Dr. Stern, and he has a slightly different strategic view of what we should do than his predecessor. And I chose to accommodate that.

Mr. MOLLOHAN. Yeah. That was the kind of example I was looking for. Are there other such examples?

Dr. GRIFFIN. There are, but that was not in response to a budget cut. That was just in response to, as Dr. Stern indicated, we do get assessments of our efforts by the National Academy. This one is a new one. This assessment was not in evidence at this time last year.

I am a little torn. It is sometimes asserted that we are not sufficiently responsive to the wishes of the National Academy, though I try to be. And, yet, when we are responsive to the wishes of the National Academy, it causes change. And change has always two sides. Those who are on the receiving end of the result of the change are always happy. Those who are on the giving end of a change are always unhappy. It is very hard to know what to do. We believe that our Science Program is not only responsive but very responsive to the priorities that the National Academy sets forth and——

Mr. MOLLOHAN. Yes.

Dr. GRIFFIN [continuing]. Sometimes that does result in changes.

Mr. MOLLOHAN. I was after an example as to how your program has changed not because of any academy's recommendations but because of the budget realities that you were facing from OMB or Administration or otherwise. That is really what I was fishing for.

Dr. GRIFFIN. Our program has not changed as a result of any budget surprises from the Administration because there have not been surprises. The President's requests have been very consistent.

Mr. MOLLOHAN. Mr. Culberson.

SHUTTLE RETURN TO FLIGHT COST COMPENSATION

Mr. CULBERSON. Thank you, Mr. Chairman. Forgive me for running a little late. We had a vote and our hearing is going on at the same time.

Dr. Griffin, thank you, all of you, for the work you are doing. You know how passionately devoted I am to you and the mission at NASA as everybody on the Subcommittee is. There are no party distinctions or labels here. We are all equally committed to help NASA achieve its goals.

And I know that you are constrained by your position to defend the White House funding request, but I have noticed that while the White House laid out the vision, they have never in my opinion adequately funded it or given you the resources you need to do everything on your table.

And I know that perhaps this has been asked before about the billion dollars that the Congress tried to give you last year, to give compensation to NASA, for example, for the loss of the shuttle. And in a very real sense the Agency, NASA, our space program is self-insured, the vehicle loss.

We can never replace those astronauts who lost their lives, but the vehicle itself was never replaced as with Challenger, correct? We have never compensated NASA as we did for Challenger?

Dr. GRIFFIN. We are not replacing the Shuttle because the determination has been made to retire the fleet.

Mr. CULBERSON. Right.

Dr. GRIFFIN. So that individual Shuttle was not replaced, and NASA was not compensated for the $2.7 billion in return to flight costs. That is correct.

Mr. CULBERSON. That was my point. It is a $2.7 billion cost is what I was driving at.

Dr. GRIFFIN. We assessed that cost a year or so ago in response to a question for the record. The Shuttle Return to Flight costs were about $2.7 billion and those came out of extant programs at NASA.

HURRICANE KATRINA

Mr. CULBERSON. And on top of that, you had Hurricane Katrina damage, where you had the potential of flooding damage at one of your facilities——

Dr. GRIFFIN. That was Hurricane Katrina, sir.

Mr. CULBERSON. That was Katrina. And a couple of NASA, I understand, employees stayed behind and ran the pumps and saved the facility. Is that fundamentally the story? There would have been even more damage but for the initiative and bravery of a couple of NASA employees. And who were they and what——

Dr. GRIFFIN. They were actually Lockheed Martin employees.

Mr. CULBERSON. What did they do specifically to save the facility?

Dr. GRIFFIN. Well, when others evacuated, there was a ride-out crew that was formed to stay behind and there were several folks who were on that crew. They drove out and walked out in hurricane weather conditions to a pumping station which needed manual intervention to keep the pump running. The Michoud Facility where we build Shuttle external tanks and where we will be building tanks for our new rocket fleet, the Michoud Facility is in a very low-lying area next to the water because we ship these tanks by barge.

Mr. CULBERSON. Right.

Dr. GRIFFIN. It is surrounded by levies which keep the water out. The water surge from Hurricane Katrina topped the levies by a little bit and so the internal area would have flooded had the pumping station not been able to keep up with the influx of water. Through the bravery of these employees, the area was saved. When I flew over it by helicopter a couple of days after Katrina, Michoud was an island of green in a sea of brown mud stretching 150 miles long along the coast by about three or four miles inland. It was quite startling to see.

NASA awarded to all of the employees who stayed behind, a "NASA Exceptional Bravery Metal" for their service. We would not be flying a Space Shuttle today, we would not have completed the international Space Station if those people had not taken that risk.

Mr. CULBERSON. Driven out there that night and turned on the pumps manually. It is a great story. And I wanted to reemphasize it here because those employees not only saved the shuttle program, allowed it to continue, but also saved—you suffered how much damage and then how much more would have been suffered, do you think?

Dr. GRIFFIN. I have misplaced in my memory the dollar figure for the Katrina damage that we assessed. I can get that for you for the record. It was many tens of millions of dollars, had we lost the entire facility, its replacement value, I do not know.

[The information follows:]

As of January 2008, the total cost of NASA's response to Hurricane Katrina on the Gulf Coast, including operations, programmatic recovery, facility repairs, and risk mitigation efforts, was estimated at $385.1M.

Mr. CULBERSON. Right.

Dr. GRIFFIN. But it is enormous.

ADEQUATE FUNDING FOR NASA

Mr. CULBERSON. Just to conclude, and you know how passionate I am, all of us are, we want to help. But I hope you can help us help you.

And I see in the February 18th issue of Aviation Week a report. There was a meeting that took place at Stanford University to look at the current vision for space exploration, what NASA has got on its plate, how much money there is available.

You know, it was a top-flight group of scientists and engineers hosted by the Planetary Society and Stanford University Aeronautics and Astronautics Department brought together about 50 top U.S. space officials quoting from Aviation Week February 18th, including NASA industry and university personnel.

But they point out in the article, and I want to, you know, point this out for the record because this is an indisputable fact, "The failure of the White House to secure the funding needed to initiate the vision has led us to a point where the nation's space program is in peril," says Scott Hubbard, Co-Chair of the event and a consulting professor at Stanford and former Director of NASA in its Research Center.

NASA's annual budgets are running $3 billion short of what is needed each year to fulfill even the Bush vision. You know, based on what you have told us of the $2.7 billion cost to return to flight that was not compensated, obviously the damage from the hurricane.

I just hope you will help us help you find a way to get you the funding you need because the science programs have suffered. The Mars program has been whacked which is unacceptable.

I have to say the operating plan that I have heard was submitted, I know that Mr. Schiff and I are arm and arm on this, with the cuts that have been instituted at the Jet Propulsion Laboratory and some of the other science programs, I just do not accept and we are going to need to work together.

Mr. Chairman, I know Adam and I are arm and arm with making sure. We do not want the operating plan to go forward until these concerns at JPL and the other science labs, the other centers are addressed.

I just see what you do, what NASA does, what we do in investing in scientific research in general in the United States is a national insurance policy.

And I know you do not have enough money to do what you need to do, but I do hope you will help us help you by. Even if it is outside of the Committee hearing process, tell us what you need so we can help you get there.

Dr. GRIFFIN. Sir, JPL is fully funded. There are no layoffs coming at JPL.

Mr. CULBERSON. I am concerned about cuts in the SIM program, for example. I am concerned about the outer planets program, the highest priority of the decadal survey of planetary scientists.

Until recently, the last couple of years, it is an undisputed fact that NASA has always flown the missions designated by the decadal survey of planetary scientists. NASA has always flown those number one missions, whether it be the, you know, the inner planets, the Earth missions, or the outer planets. You have always flown them.

Cassini was the last one we did and you know that the mission to your robot that we have talked about before is the highest priority of the decadal survey and you keep stringing that one along and whacking it and whittling on it. And it is just tragic. I just do not think it is—it is not acceptable.

I am going to work with Mr. Schiff and the Committee to find ways to fix that. And that is money you are taking out of hide of these other science programs to fund inadequate recommendations from OMB. And I admire the job you are doing and support you. This is all said in a friendly way. I want to help. I just want to find a way to help and we just need you to help us help you.

Thank you very much for the job that all of you are doing.

Dr. GRIFFIN. Thank you.

Mr. MOLLOHAN. Mr. Ruppersberger.

PROGRAM MANUFACTURING FAILURES

Mr. RUPPERSBERGER. Again, we all have different hearings. Sorry I was not here in the beginning.

I want to talk about the satellite program generally, and specifically the manufacturing. Adam Schiff and I are both on the House Intelligence Committee and I am Chair of the Technical Tactical Committee. And we are focusing on some of the satellite failures that we have had recently.

We have been having tabletop discussions for about maybe six months with the general contractors that work in conjunction with DoD and we are trying to find out where our successes are, our failures are, where we are in our space program presently and where we will be in the future.

We have gotten a lot of good information. And I want to tell you what we have learned and how it compares to where you are.

We have had numerous failures within our satellite program. We have had manufacturing failures. We have had timing problems. We have had cost overruns. And it is to the point where we really have to look at where we are with respect to our satellite program generally.

I think one of the main themes that has occurred here is that we have found that research and development is occurring once the contract is out instead of before a contract is in place. And what I mean by that is that we go out and, you know, the big hitters that do most of this manufacturing are in a position where they get the contract and then as they move forward with the contract, they are really doing the research and development. And, therefore, we have been having failures and cost overruns.

What I think we are going to recommend is that we really need to refocus on our research and development before it even gets to manufacturing. There really should not be the failures that have existed in our program in the last ten years if the research and development is done properly. The mistakes are made in research and development.

The other thing we are seeing, too, is that when you get a satellite built, everyone tries to pile on instruments. You know, a three-star General will come and say I have to put my program on it, I have to put my program on it. And because of that, we have not stayed focused on what our mission is.

Now, these are some of the results that we are getting out of what we are doing on the Intel Defense side. How does that compare to where you think you are with respect to your satellite programs?

Dr. GRIFFIN. We think in recent years, our record of success has been extraordinarily high. I do not know what to say other than that.

Mr. RUPPERSBERGER. Well, let me ask you this. I will ask you this. Has every program been on time?

Dr. GRIFFIN. Well, certainly not. We have had some delays. We have had some cost overruns. Right now we are experiencing a cost overrun on the Glory Mission because of the APS sensor, the Aerosol Polarimetry Sensor Instrument. So our record is certainly not perfect. But we have not had significant mission failures or crippling cost overruns or schedule delays in recent years.

Mr. RUPPERSBERGER. Well, even though it might not be as severe as where it is on the other side that we are talking about, you have had problems with cost overruns.

So what are the reasons for the cost overruns and for the delays specifically? Where I am heading, so I can tell you what I want to talk about, is that it is my understanding there is again more cuts in research and development in the Administration's budget. And I think that is very dangerous in the area that we are dealing in. And I know that you have to stand by the President's budget, but it is something that we as an Oversight Committee need to talk about.

Dr. GRIFFIN. Yes, sir. I do understand. Our budget this year almost, but not quite, keeps pace with inflation. So I cannot say that the budget has been cut. We have been given funds adequate to support the missions——

RESEARCH AND DEVELOPMENT BUDGET

Mr. RUPPERSBERGER. You cannot say that the research and development budget has been cut?

Dr. GRIFFIN. It has not been cut.

Mr. RUPPERSBERGER. Okay.

Dr. GRIFFIN. NASA's research and development budget has not been cut. We have funds adequate to support doing the missions that the President has asked us to do.

Again, we are in the business of developing one of a kind, first of a kind things. We do things for a living that no one has ever done before using the best contractors in the industrial base that the nation has. Things do not always go perfectly, but I have to say that for the last few years, our record of execution has been unmatched.

Mr. RUPPERSBERGER. Do you feel that you need more resources in research and development?

Dr. GRIFFIN. I have the resources I need in the President's budget to accomplish the program that has been set forth.

Mr. RUPPERSBERGER. You are a good soldier. I don't mean that in a derogatory way. I mean, if that is what it is, and I think we are going to get—our staff is going to have to look more into this, because I am really surprised at the comment. And that doesn't mean that I don't agree with it.

I just don't have enough data to understand that you don't need more research and development. That we have cost overruns and there needs to be a reason for it. And there needs to be a reason for time delays.

ICE, CLOUDS, AND LAND ELEVATION SATELLITE (ICESAT)

Let me give you an example of a time delay. Let us discuss a program that the Goddard Space Flight Center is work on, the ICESat–II mission. You know the Congress has urged NASA to move more quickly in developing the next generation of needed Earth science missions and satellites due to the fact that many existing missions are near the end of our usable life in the coming years. Do you agree with that statement?

Dr. GRIFFIN. Yes. The decadal survey has urged us to put up more satellites.

Mr. RUPPERSBERGER. But our concern is—it is our understanding that this mission, the ICE——

Dr. GRIFFIN. ICESat–II.

Mr. RUPPERSBERGER [continuing]. Is going from 2010 to 2013. And the date now is 2015. This is an example of what I am talking about. Now let me tell you why I am concerned about this.

First thing, we have an area of climate change. We are concerned that there could be an area where we won't be able to get the information to really determine what is going on with respect to the issue of global warming.

Congress I think specifically provided $33 million in fiscal year 2008 to jump start several of the missions that were recommended by the National Academy of Sciences. And here we have a program that we thought was going online in 2010 to 2013. And now we are seeing 2015.

There is an example of a program that I am concerned about where we are—we are going to be at 2015. When, in fact, what we thought would be 2010 or 2013.

Dr. GRIFFIN. Well, sir, the program is not experiencing an overrun or a delay. Alan, would you care to comment?

Mr. RUPPERSBERGER. Yeah. I would like to hear what Mr. Stern has to say.

Dr. GRIFFIN. This is Dr. Alan Stern who runs our Science Mission Directorate.

Dr. STERN. Yes, sir. In fact, you probably know that this year we have actually put more emphasis in the Science Mission Directorate on Earth science programs, just like the one that you described. And because of that initiative, which infused about 600 million additional dollars into our Earth science program, we are actually able to start four decadal survey missions that were only recommended last year, including ICESat–II. We currently have on orbit ICESat–I with an operational capability expected to last several more years. So from our perspective, we have finally put ICESat–II on firm footing, along with other measurement needs like the soil moisture mission, which will be launching before it and other decadal survey missions that will launch concurrently after it as a result of the President's budget.

Mr. RUPPERSBERGER. So you are basically saying that ICESat–I is in place. That we won't go dark until ICESat–II is in place.

Dr. STERN. Well, ICESat–I is in place. It is functioning nominally. I can't promise you that it won't go dark in the interim. But it currently has no anomalies. It has some life-limited items. But it is expected to last several more years.

Mr. RUPPERSBERGER. With the initial procurement or contract, what was the initial date that the ICESat–II was supposed to be completed?

Dr. STERN. I would have to take that question for the record and get back to you on it.

Mr. RUPPERSBERGER. But was it before the 2013 date projected earlier? The date now that you are projecting is 2015.

[The information follows:]

ICESAT–II (ICE, CLOUD, AND LAND ELEVATION SATELLITE) MISSION

The President's FY 2009 budget request, which was released on February 4, 2008, included the first assignment of funding for the Decadal Survey-recommended missions. The President's FY 2009 budget request provided sufficient funds—as one component of the line of "Decadal Survey Missions"—to begin formulation of ICESat–II, with a target launch date in FY 2015.

NASA has not pushed back the launch date of ICESat–II. NASA has established an executable implementation plan that accomplishes the necessary ICESat–II mission and implementation development within the allocated resources.

The Decadal Survey, released in January 2007, recommended an ICESat–II mission at a cost of about $300.0M. Throughout 2007, NASA conducted concept studies of all proposed Decadal Survey missions, including ICESat–II. These studies were intended to demonstrate the feasibility of, and challenges associated with, the mission concepts, and did not define baseline missions. One of the findings of the ICESat–II concept study was that a simple re-flight of the ICESat–I mission design would cost as much as 90 percent more than the amount estimated by the Decadal Survey.

A launch date of 2015 was determined by NASA based on many considerations, including but not limited to: (1) technical issues uncovered during the current on-orbit ICESat–I mission, e.g., laser limitations and the need to define and develop a reliable laser system; (2) necessity to define a clear and comprehensive trajectory of requirements from the mission science objectives to the measurement and mission requirements, including such issues as lifetime and reliability; (3) a detailed mission implementation budget profile leading to high confidence in the cost and schedule; (4) developmynt of appropriate risk reduction activities with appropriate redundancies; and, (5) the current maturity level of the mission definition and required measurement technologies. NASA has embarked on an expedited activity to select a Science Definition Team (SDT) through competitive proposals solicited through an Amendment to the 2008 NASA Research Opportunities in Space and Earth Sciences (ROSES). NASA, working with the SDT and others during the current pre-Phase A formulation stage, will define the optimal mission configuration compatible with allocated resources. This extended team will investigate partnerships with non-NASA organizations, study instrument and mission designs, and examine science requirements to identify significant cost and performance parameters.

Dr. STERN. I will have to get that answer for you. The decadal survey that recommended ICESat–II, and I will admit to being new to the NASA program, was just released last year. Our response to it came the same year.

Mr. RUPPERSBERGER. You know, it is not about defending your program. It is about really doing—finding out the right way. Finding out the system. We need a good system in place.

If we need more research and development—let us say that we do, especially in NASA. I mean, the reason we are doing so well in the world, that we control the world, we control basically the skies, is because of what NASA did in their research. And we have to continue to focus on that.

But, you know, there have been some failures. And we have to admit some of our failures to make sure that we don't do them again. And we do better, because we have a lot of competition out there with China, Russia.

So I will stop there. But I would like more information on that. Thank you.

Dr. STERN. Yes, sir.

GLORY MISSION

Mr. MOLLOHAN. If I could follow up, Dr. Griffin, with——

Dr. GRIFFIN. Sure.

Mr. MOLLOHAN [continuing]. Dr. Stern, a little bit on Mr. Ruppersberger's questions about the satellites.

It has been a huge issue with the Committee in dealing with the Senate. They have expressed great concerns about that about the satellite productions, the development, and the cost overruns. So in the spirit of you helping us look at this, us help you with regard to these issues, what should we be sensitive to?

Take Glory, for example. What is happening there that resulted in the cost overruns and the delays that we should be looking at? What should we be concerned with? And what would you recommend the kind of oversight we have in order to help you get it done? Is there not a performance issue or something here that we should be very sensitive to?

Dr. STERN. Well, that is an interesting example that you raise. And I will try to answer. We think we should be sensitive to it too. And we are. The Glory mission exists for the primary purpose of making these aerosol polarimetry measurements, because aerosols are a key component. The contribution of aerosols is a key component to climate research models in global warming. Aerosols have a cooling effect. Yet their exact influence is not well known. So we are making a measurement to try to refine the models for climate change research that NASA is responsible for.

The particular sensor in question is being built by a contractor who moved and consolidated some of that contractor's workforce from one location to another. It may well be that in the long run, that move and that consolidation of contractor workforce in this particular case could be helpful. I don't know. I can't foresee that future. But they obviously did it as a business, because they thought it was a good move. But in the period of time where they are building our sensor, work progress has slowed quite a bit. In fact, it slowed to about 60 percent of the rate that we had expected and that was matched with the funding that was provided.

Mr. MOLLOHAN. You mean developing the sensor?

Mr. STERN. Developing the sensor. Now it is a research and development sensor. I mean, that is what you passed to do. So it is a first of a kind type thing. It is going well. Technically the sensor is meeting its goals. But it is slow.

Mr. MOLLOHAN. You mean now it is?

Dr. STERN. Well, the sensors development progress is good. But it is slower than expected. I mean, so it is not encountering technical difficulties. It is just slow. Because it is slow, it costs more money.

The total amount of money in question is a total of maybe $80 million of which about $70 million of it is due for that sensor directly and its effects on the rest of the spacecraft, because it is showing up late.

That is a development problem, which we are certainly not proud. The contractor is not proud of it. These things do happen from time to time. We are, I want to say in the vernacular, we are all over it. We are working with the contractor. The CEO of the contractor was in my office two weeks ago to discuss specific steps that they are taking to mitigate the damage. But the fact is that when the government undertakes development contracts like this, they are usually on a cost-plus basis. So while we monitor and direct their performance, we do have to pay the overrun.

I believe we will eventually have a good satellite, and that we will make an important scientific measurement, which will contribute in a very significant way to our climate change research. But this particular example is an example of an overrun. And that is the reason why.

VISIBLE-INFRARED IMAGERY RADIOMETER SUITE (VIIRS)

Mr. MOLLOHAN. We are also having problems with VIIRS.

Dr. STERN. Yes, sir.

Mr. MOLLOHAN. I mean is there something about the sensor development? And how can we do it better? And then I want to yield to Mr. Ruppersberger.

Dr. STERN. NASA is not directing the VIIRS contract. I want to make it clear. That is a DOD contract. Although we are dependent upon VIIRS, because we are flying VIIRS on the in-post preparatory program. It is the predecessor to NPOESS. It is not a good news story. It is late, and it is having technical difficulties. We will eventually get it. I am sure there are a lot of lessons learned there for all of us. Now, you are right. You raised a very good point when you say that there are sensor problems. I do think that there is a need in the country, on the government side, for us to look at the industrial base for advanced sensor development and to take steps. We need to do something different, because we can't keep having these problems.

I was discussing this issue just last week with Admiral Lautenbacher of the National Oceanic and Atmospheric Administration. I think we are in agreement that we need to take steps to restore capability that once existed in our industrial base and that has managed to dissipate. That is not going to help us this year or next. We will just have to struggle through, but in the longer term, I think there is work we can do here.

Mr. MOLLOHAN. Mr. Latham, if you don't mind, Mr. Ruppersberger had a follow up. Mr. Ruppersberger.

Mr. RUPPERSBERGER. Mr. Stern, get me more information if you could. And I am not sure of the time frame. But we have to, again, evaluate where we are, our successes, and our failures.

It is my understanding, and I can't give you the time frame, that we—NASA has had I think eight Nunn-McCurdy breaches, seven at 15 percent and one at 30 percent. If you could get me the information on those and get back the reason why. Again, I am focusing on the issue of research and development to see why we are where we are. To make sure that we can see where you are and also from our intelligence and defense side too.

Dr. STERN. Yes, sir. We will provide you with just that information.

[The information follows:]

ICESAT–II (ICE, CLOUD, AND LAND ELEVATION SATELLITE) MISSION

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A launch date of 2015 was determined by NASA based on many considerations, including but not limited to: (1) technical issues uncovered during the current on-orbit ICESat–I mission, e.g., laser limitations and the need to define and develop a reliable laser system; (2) necessity to define a clear and comprehensive trajectory of requirements from the mission science objectives to the measurement and mission requirements, including such issues as lifetime and reliability; (3) a detailed mission implementation budget profile leading to high confidence in the cost and schedule; (4) development of appropriate risk reduction activities with appropriate redundancies; and, (5) the current maturity level of the mission definition and required measurement technologies. NASA has embarked on an expedited activity to select a Science Definition Team (SDT) through competitive proposals solicited through an Amendment to the 2008 NASA Research Opportunities in Space and Earth Sciences (ROSES). NASA, working with the SDT and others during the current pre-Phase A formulation stage, will define the optimal mission configuration compatible with allocated resources. This extended team will investigate partnerships with non-NASA organizations, study instrument and mission designs, and examine science requirements to identify significant cost and performance parameters.

Mr. RUPPERSBERGER. Thank you.

Mr. MOLLOHAN. Okay. Mr. Latham.

CIVIL SERVICE WORKFORCE RETIREMENT

Mr. LATHAM. Thank you, Mr. Chairman, and welcome. I serve on three Subcommittees. Government-wide we seem to have a problem with a whole generation of people near retirement, ones with institutional knowledge.

Do you have this problem at NASA? Are you doing anything to address that problem? You know, basically the whole program geared up what 35–40 years ago. And you probably have a bunch of people who are on the edge of retirement. Is that a problem for you?

Dr. GRIFFIN. Well it is a problem, and it is an opportunity, sir. The average age of NASA employees is right around 50. Demographically our statistics are such that within the next five years, about 25 percent of our civil service workforce is eligible for retirement. That doesn't mean that they will necessarily take it. But they are.

There is——

Mr. LATHAM. I used to think that was old by the way, 50.

Dr. GRIFFIN. I must say that I would——

Mr. LATHAM. So much has changed.

Dr. GRIFFIN [continuing]. Kill to be 50 again. But leaving that aside——

Mr. LATHAM. Okay.

Dr. GRIFFIN [continuing]. It is a concern, because in our business there is much that is not written in textbooks. And I have——

Mr. LATHAM. Right.

Dr. GRIFFIN [continuing]. Written a textbook. There is an awful lot that is not in there. So we rely in this business on developing one-of-a-kind things, we rely on in many ways a master and apprentice relationship if I could use those words. Where folks who are older and more experienced pass on what they have learned and what they know to younger folks coming up.

Of course, if we get a wave of retirements of more experienced folks, then we do chance losing some knowledge. Now we are very fortunate. Everybody who works for NASA is in one way or another a volunteer, because they could all make more money working somewhere else.

We have very good access to our network of retirees and former NASA and industry employees. They do serve an awful lot of mentoring for our younger folks. But there is a concern there. We pay attention to it. It is also an opportunity, because the newer, younger folks who are 30 and 35 years younger than me coming out of school, know things I don't know and that Bill Gerstenmaier and others here at the table here don't know. So when we have an opportunity to bring new young folks in and put them to work on our programs. We love that, because our overall civil service workforce is capped at 17,900. We really only can hire new people through attrition of older people.

So it really is, sir, in the spirit of your question, it really is both a problem and an opportunity. It is a problem to manage it right, so that the more experienced folks pass on their knowledge before they leave the agency. But it is also an opportunity to get the best and the brightest out of universities that teach stuff that sure wasn't known when I was going to school.

Mr. LATHAM. Well you kind of lead me to my next question. I have two universities in the state of Iowa that are members of the University Space Research Association. And they believe you should spend more on the programs that provide funding for hands-on training and research at the undergrad and graduate levels. And that would be about one percent of your budget. I just wonder whether you agree with that level or not and why?

Dr. GRIFFIN. I wish I could spend more on everything we do. I really do. One of the best things that we can do for young scientists and engineers is to provide small instrument design, construction, deployment, and operations experiences so that they can learn the business. We do have a robust Suborbital Program, where payloads are typically smaller, lighter, less expensive, and less consequential if lost, which is an important thing when you are dealing with young folks.

Mr. LATHAM. Mm-hmm.

Dr. GRIFFIN. Also Alan Stern, to introduce Alan again, our Science Mission Directorate, just released within the last couple of weeks a request for information about the possibility of using commercial space transportation, which is coming along as rides of opportunity. That NASA could be an anchor customer for such commercial space transportation capabilities, so that the instrument and the principal investigator could ride on a suborbital space flight and conduct research that we now do on unmanned sounding rockets and suborbital projectories. So we are paying attention to that. I don't think that I would want to allocate more money right now to that program, because anything I allocate to one program is money that must come away from another. It too has its proponents and adherents.

Mr. LATHAM. Do you know about what level it is today? They talk about one percent.

[The information follows:]

RESEARCH TRAINING OPPORTUNITIES AT THE UNIVERSITY LEVEL

the university research community is essential for advancing NASA's strategic objectives in science and for realizing the nation's return on investment from NASA's Earth and space science programs. Discoveries and concepts developed by the university research community are the genesis of scientific priorities, missions, instrumentation, and investigations. Although not always tied to specific missions, the tasks funded in the university research community add value to missions in the form of post-mission data analysis, observations required for mission design, mission observation support, and joint scientific campaigns.

More than two-thirds of NASA sponsored Earth and space science research is conducted by the university community. Without this research, NASA's expensive science missions would only yield a stream of ones and zeros from space. The university research community converts the data from NASA's science missions into discoveries, knowledge, understanding, and more questions. Those new questions are what drive the research and development leading to the next generation of space missions.

The university research community is also an essential partner in workforce development for NASA and the Nation. The university-based research and technology projects sponsored by Science Mission Directorate allow students and post-doctoral researchers to gain invaluable NASA science program work experience as part of their education and professional training. The suborbital programs (airplanes, unmanned aerial vehicles (UAVs), rockets, and balloons) and principle investigator-led missions enable students to participate in the entire lifecycle of a science mission from design and construction to flight and data analysis. These hands-on opportunities lead to experiences in problem solving and increased understanding of the systems engineering that is the underpinning of successful science missions.

Dr. GRIFFIN. I would have to—I would have to take that for the record.

Mr. LATHAM. Okay. How are we doing on—Mr. Chairman?

Dr. GRIFFIN. I don't know what our suborbital program is.

Mr. LATHAM. Fine.

Dr. GRIFFIN. Our student program. But I will get it for you for the record.

FOREIGN AND DOMESTIC SUPPLIERS

Mr. LATHAM. Okay. I think I am just going to do one more question. And then I have another hearing. The GAO has noted in the past, questions about the percentage of the resources spent on acquisition, supplies, and services from foreign suppliers. You had a problem tracking—the things that you were purchasing. Where they were coming from, etc.

Have you made any effort in that regard so we get a better handle on foreign or domestic suppliers for NASA? It comes from the GAO.

[The information follows:]

FOREIGN CONTRACTS

In FY 2007, procurement obligations represented approximately 81 percent of NASA's budget. NASA obligated $14.363B on the acquisition of supplies and services in FY 2007, of which $209.4M, or 1.5 percent, was related to foreign suppliers.

NASA relies on information contained in the Federal Procurement Data System—Next Generation (FPDS–NG) to obtain information on Federal contracts. FPDS–NG provides data on place of performance and vendor addresses, allowing NASA to collect reliable information on prime contracts with foreign suppliers.

Further, NASA continues to partner with the Office of Management and Budget and other Federal agencies in the development and implementation of a Government-wide subcontract reporting system.

Dr. GRIFFIN. I understand, sir. I understand your question. I will take it for the record, and answer it as closely and carefully as I can. I am not aware of a problem that we have in tracking whether or not we have

Mr. LATHAM. The GAO said there is a problem.

Dr. GRIFFIN. They may say that. We have failed for several years in a row to get an unqualified opinion of our audit from our independent auditor, because of property tracking difficulties with regard to mostly the Space Shuttle programs, older property. A lot of that equipment was bought and is still in service. It was bought in years in which property was not tracked as carefully as we do now. It is possible that some of that equipment was purchased from foreign suppliers. It may be that to which the GAO refers.

We are working with our independent auditors to establish a means by which we will write down and allocate these properties as they are retired from the shuttle program in the next couple of years. Then going forward, we should have a very accurate property accounting method in place, because all of our new property is under our new system.

Mr. LATHAM. Yeah.

Dr. GRIFFIN. And we should be in good shape.

Mr. LATHAM. All right. Thank you very much for the work you do. And very much appreciate it. Thank you, Mr. Chairman.

Dr. GRIFFIN. Well thank you for the opportunity to do it. I love this stuff.

Mr. MOLLOHAN. Mr. Honda.

Mr. HONDA. Thank you, Mr. Chairman. And good afternoon, Dr. Griffin.

Dr. GRIFFIN. Good afternoon, Mr. Honda. Good to see you again, sir.

STRATOSPHERIC OBSERVATORY FOR INFRARED ASTRONOMY (SOFIA)

Mr. HONDA. And you. Let me get back to the subject that we left on last year in 2007. We had some discussion last time around the SOFIA Project. And particularly about the project management, structure, and the home for the aircraft. And I was wondering whether you had an update on that project, its disposition right now?

Dr. GRIFFIN. Well, NASA has a fleet of research aircraft, of which SOFIA is one. We think the proper basing strategy for our aircraft to get economies across the fleet is to base the aircraft at Dryden. And I have not had a reason to change that view. The program management of the SOFIA aircraft is being accomplished at Dryden, because it is a major modification of a Boeing 747 Aircraft. We are doing that at Dryden. Now, that particular aircraft will be hangered in a rental hanger at Palmdale.

Mr. HONDA. Right.

Dr. GRIFFIN. Which from an overall cost perspective made sense to do. I think we are running the program properly and efficiently. Science operations will continue to be orchestrated and managed out of Ames. But with SOFIA, we are not in the stage of doing science operations. We are in the stage of trying to build, if you will, an experimental aircraft. The place at NASA where we build experimental aircraft is at Dryden. So I think things are being done in the right order and in the right place.

Mr. HONDA. Again, we had that discussion about——

Dr. GRIFFIN. Yes, sir, we did a year ago. I am sorry, things haven't changed.

Mr. HONDA. But the efficiency of location of science and aircraft. The concern I had was that I had a communication that said that the facility was going to be not available in a couple of years. And I understand that plans are already being made to do—what to do with the space that they have right now. They are making other plans right now.

Dr. GRIFFIN. Well that is why we rented a hangar in Palmdale, because the Edwards Air Force Base hangar facility would not be available in a couple of years. So we need to keep the aircraft close to the workforce, which is doing the modifications. So, Palmdale and Mojave Airport is in that general suite of airports that occupy that region of the Mojave Desert where we do advanced aircraft development and flight testing. So, it seemed the logical alternative for us to go there.

Mr. HONDA. So the modification of the aircraft, that is the only place you can do that then there and——

Dr. GRIFFIN. Nothing is so absolute, sir. We——

Mr. HONDA. I was just trying to understand that. Our discussion last year was about the facility being appropriate and modified for the aircraft. And I didn't remember that that was the case.

And I guess I understand from what you are telling me is that the facility is modified. And it is appropriate. And it being placed there for the benefit of the aircraft, is something that cannot be done at Ames along with the science of the program for SOFIA program. And——

Dr. GRIFFIN. Well, I want to be careful. I mean, with enough time and money anything can be done. I could detail a bunch of folks from Dryden Flight Research Center where they are doing the aircraft modifications. They could be detailed up to Ames. But that wouldn't be the most cost effective solution for NASA. The most cost effective solution for NASA to manage its money and accomplish the SOFIA program is to base the aircraft out of Dryden and to modify it there, work on it there, and maintain it there.

Mr. HONDA. So are we coming along with that project?

Dr. GRIFFIN. Well, Alan—I am sorry, Mr. Honda, this is Dr. Alan Stern. I would like him to report. You have had several successful SOFIA flights this year, right?

Dr. STERN. Yes, sir. I run the Science Mission Directorate for NASA. And SOFIA began its in-flight testing just last year. It had a very successful flight test series, which we have now wrapped up that phase one series. The aircraft is now in modification for door open testing. As you know, this is a Hubble Space Telescope Class——

Mr. HONDA. Right.

Dr. STERN. We have to open a door. It is two and a half meters across on the side of the 747. That has never been done before. But those modifications, as well as upgrades to the telescope pointing system and the infrastructure that it needs, are now in process for the open door flight testing that will begin later this year. That is on track. We expect by the latter part of next year, 2009, to begin science operations with the two first flight instruments. I would like to point out that we are very proud of that. That previously, just a year ago, had someone been here telling me that story, the first flight science operations would have been starting a couple of years later. We were going to wait for the entire suite of instruments to be ready before we began any science. We made a change to increase our productivity to begin when we had the first two instruments ready, so that we can start to become productive and learn how to use this phenomenal observatory.

I would invite you to come out to California, Dryden, and take a look at the bird and see it. It is very impressive to see a telescope of that size in a mobile platform, the scale of a 747. No other country possesses anything like this kind of capability. We are really looking forward to turning it on.

Mr. HONDA. So some of the concerns that were mentioned last year, I thought it was about its functionality and the aerodynamics of the aircraft, because you are going to be opening——

Dr. GRIFFIN. Yes, sir.

Mr. HONDA. So that is all taken care of then or——

Dr. GRIFFIN. Well we are in the middle of that. We have not flown it opening the door in flight. I mean, that is what Alan was just getting to talk to you——

Mr. HONDA. How well do you perfect that to be——

Dr. GRIFFIN. Pardon?

Mr. HONDA. Nothing. I am just——

Dr. GRIFFIN. Okay. Well, right. I don't want to fly in it either until we perfect that. SOFIA is years late. It was not well managed earlier on. Starting a couple of years ago we began to make changes in how we were managing the project, where it was being managed, who was doing it, and getting it on a more realistic schedule. That involved relocating the project from Ames to Dryden to get the engineering work in the right way and changing contractors. We made a lot of changes to the program. We have been severely criticized, because any time we move a piece of work from one area to another area, it creates a lot of angst in the area that it is being removed from. But I think the results that we have gotten out of the SOFIA aircraft progress in the last year justify the moves and the changes that we have made. It is going well. We think it is going to continue to go well. We are on top of it.

We look forward to creating a world-class observatory here. This too was a decadal survey priority. We are years late in accomplishing it. We are proud of what we have done over the last year.

Mr. HONDA. Yeah. I understand the problems. Just for the record, I am just trying to make sure that we keep mentioning it so that we can track it and meet the benchmarks.

Mr. Chairman, do I have——

Dr. GRIFFIN. We are paying attention to SOFIA.

NEAR-EARTH OBJECT (NEO)

Mr. HONDA. Okay. Thank you.

Yeah, the other question, Dr. Griffin, at a hearing on the near-earth objects held by the Subcommittee on Space and Aeronautics in the fall of 2007, expert witnesses testified on the need for the planetary radar capabilities of the Arecibo Observatory, to characterize potentially hazardous near-earth objects in a timely fashion.

I have been told that NASA officials have said that NASA does not need the Arecibo Observatory. And that optical telescopes can provide that necessary data. The language that accompanied the 2008 Omnibus Appropriations states that, "NASA is directed to provide additional funding for the Arecibo Observatory."

Could you elaborate on NASA's position on Arecibo? And has NASA met with the NSF on the future of Arecibo? And I think that—is it Cornell University that is part of that program also?

Dr. GRIFFIN. Yes, sir, it is. It is Cornell.

Mr. HONDA. Okay.

Dr. GRIFFIN. Obviously, let me start my answer by saying NASA will comply with the law. Now that said, the Arecibo Observatory is not a NASA facility, was never a NASA facility.

Mr. HONDA. Right.

Dr. GRIFFIN. It is a National Science Foundation facility. They have concluded they no longer want to maintain it. It is more than somewhat frustrating to have someone decide that simply because the National Science Foundation has decided they no longer need it that NASA should now take care of it. We are not the Salvation Army. If we are directed to maintain Arecibo in law, then we will do so. But it is not our facility.

Mr. HONDA. Is there other groups that NASA cooperates with to move along with projects, or is this one of them?

Dr. STERN. I am sorry. I didn't quite understand the question, sir.

Mr. HONDA. Does NASA have contracts with other organizations on projects such as observation of near-earth objects and things like that? Is this a situation where we have a relationship with the university?

Dr. STERN. Yes, sir. I am still not quite sure I understand. But let me try to answer. You correct me if I am on the wrong track.

Mr. HONDA. Okay.

Dr. STERN. We do quite a bit of research with Near-Earth Objects. As you know, we have a goal set by Congress for 2008 to find 90 percent of the kilometer scale or larger Near-Earth Objects that could overtime eventually impact the Earth and become hazardous.

Mr. HONDA. Mm-hmm.

Dr. STERN. We are on track for that goal. In fact, we are putting a little extra resources into that this year. The detection techniques by which we accomplish that goal are optical, not through radar. Radar's primary use with regard to Near-Earth Objects is to refine their orbits when they just happen to come very close to the Earth where the radar can detect them. We have a radar at NASA that we use at Goldstone. It is a part of our deep space tracking network for that purpose. Arecibo is a National Science Foundation facility that can accomplish the same goals. Then Arecibo has a larger antenna, so it has some advantage. But for the purposes of our program to detect these Near-Earth Objects as mandated by the Congress, we need optical instruments, not radar instruments. That is why you heard that NASA is not requiring Arecibo as a part of its Near-Earth Object portfolio.

Now in our science programs, we also have some researchers at various universities primarily, but also within the Agency itself, that are working on the characterization of near-Earth asteroids. They use a whole variety of different techniques, spacecraft missions. They do use radar from time to time. It is useful, spectroscopy, orbit determination, determining their spins, their masses. Many of their attributes so that we do better understand the objects once we have detected them.

Again, radar is only one part of that equation and, frankly, a very narrow part of that equation in terms of the characterization.

Mr. HONDA. Is there someone that I can sit down with and go over that, the whole program and the history of the project?

Dr. STERN. Yes, sir, absolutely. We would be happy to put that together for you at your convenience.

Mr. HONDA. Thank you. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Thank you. Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman. I know you are looking at that watch. I don't blame you.

Dr. GRIFFIN. I am having a bit of trouble with my contact lens. I am sorry, sir, go ahead.

INTERNATIONAL PARTICIPATION IN SPACE STATION PROGRAM

Mr. FRELINGHUYSEN. No. We are going to have you here for a day and a half. I am sure I would like to get into the weeds. But I think we are all interested in American preeminence in space. It does bother me that even though we have a good working relationship with the Russians, I don't like the notion that we would be beholden to them.

I do have a specific question relative to how the Chinese are progressing. The European equivalent of our space program has been—that they have worked pretty well with us, haven't they?

Dr. GRIFFIN. Europe and the European Space Agency and the United States are close partners.

Mr. FRELINGHUYSEN. Very close partners.

Dr. GRIFFIN. Yes, sir.

Mr. FRELINGHUYSEN. And we are working pretty closely with the Japanese in terms of their offering to the plate.

Dr. GRIFFIN. Very much so, sir.

Mr. FRELINGHUYSEN. So our working cheek by jowl with these—with our European allies and those in the Pacific.

Dr. GRIFFIN. As well as Canada, sir.

Mr. FRELINGHUYSEN. We have a lot of credibility on the line here. Not only on our own behalf, but to some extent we have promised them.

Dr. GRIFFIN. That is absolutely the case. The European, Japanese, and Canadian participation in the Space Station Program, as well as, many participatory activities in our robotic science program. Really is contingent upon the United States keeping its word, meeting its obligations and commitments to those partners for the things that we do together.

CHINESE SPACE PROGRAM

Mr. FRELINGHUYSEN. I don't mean to mix apples and oranges here. But, you know, what comes to mind is, what is it, "Rising Above the Gathering Storm," the Augustine Report. And I guess you are not specifically part of that. But to me you are part of that. You are part of, a very important part of, our scientific foundation.

The thought that somehow we would be outflanked in space by the Russians on one hand and a very aggressive, you know, Chinese program. Can you talk a little bit about—you have been to China?

Dr. GRIFFIN. I have, sir.

Mr. FRELINGHUYSEN. You discussed the general goals and achievements of the Chinese space program. Where do you see the Chinese at this point?

Dr. GRIFFIN. Well, China, with its first human mission back in 2003, accomplished at one stroke all of the goals of the U.S. Mercury Program 40 years ago, which was six space missions. With their second human mission, they got through half of our Gemini Program of the mid-1960s. Their third mission will essentially accomplish most of the remaining Gemini Programs. So the Chinese are taking very careful steps, very carefully plotted, strategically plotted. They will be putting up a three-man crew after the Beijing Olympics as they have claimed. And I believe them.

Mr. FRELINGHUYSEN. And this in itself in the general sense is all about stature? The world view——

Dr. GRIFFIN. I think it is about strategic position in the world.

Mr. FRELINGHUYSEN. Yes.

Dr. GRIFFIN. Yes, sir.

Mr. FRELINGHUYSEN. They are doing to some extent I guess what the Russians are doing. They are partnering with a lot of countries around the world that may have, you know, minimal potential for space exploration. But they are giving them an opportunity should we say to put their flag in space.

Dr. GRIFFIN. China is forging space partnerships with otherwise uncommitted nations. That is correct, sir.

Mr. FRELINGHUYSEN. How would you describe the power and the force of how they are getting into space compared with our our program?

Dr. GRIFFIN. Well they are developing—is it——

Mr. FRELINGHUYSEN. Are they leap frogging in that sense as well?

Dr. GRIFFIN. I wouldn't say leap frogging. I would say catching up. China is doing the things in space that you would expect a great power to do. They are developing as we speak, a new launch vehicle called the Long March 5. It will have essentially the same capability, maybe slightly more, as our Ares 1 and Orion vehicle, capable of taking Americans back into Earth orbit after we retire the shuttle.

So they are developing that. They will have it available by 2013 so they say. Again, I believe them. So they are catching up.

Mr. FRELINGHUYSEN. It is interesting and important. Then if you tie in what I assume is a military aspect, which they don't have I think the degree of separateness that we do, we are talking about a highly committed effort.

Dr. GRIFFIN. I would not be the one to comment on their military efforts. But certainly the Chinese space program as a whole, evidences everything you would want to see in—a program and they are very committed. They are very committed.

Mr. FRELINGHUYSEN. What do you know about how much money they are spending?

Dr. GRIFFIN. I don't know that figure. In response to several different requests I made at several different times in meeting with the Chinese space officials, here and there, they claim with great consistency that they have about 200,000 people working on their space program.

And for reference, NASA——

Mr. FRELINGHUYSEN. Do they have a system of standards like we have?

Dr. GRIFFIN. They do.

Mr. FRELINGHUYSEN. I assume they have——

Dr. GRIFFIN. They do. And NASA——

Mr. FRELINGHUYSEN. They have broken it down I assume. They have done a pretty good job of——

Dr. GRIFFIN. I——

Mr. FRELINGHUYSEN [continuing]. If not——

Dr. GRIFFIN [continuing]. Think they have.

Mr. FRELINGHUYSEN. Doing their own innovation, they obviously have done some degree of their own, should we say, reverse engineering? And I suspect some degree of espionage.

Dr. GRIFFIN. Well I don't know about that. I see plenty of evidence that they are entirely capable of having created what they have done on their own. I mention the level of their support to their program, which they claim to include about 200,000 people. They have claimed that on several occasions. Our NASA budget supports about 80,000 people.

So clearly they are focusing a very intensive effort on their program.

Mr. FRELINGHUYSEN. See as we wrestle with your budget numbers if you frame it to the American people, the potential for us to be dependent on the Russians, and a very aggressive Chinese program, this is a whole issue of American preeminence. Maybe that is expressed in the President's vision. But it is certainly inherent in what you are all about, making sure that we are second to none.

Dr. GRIFFIN. Certainly that is our goal.

TRANSITION COSTS

Mr. FRELINGHUYSEN. I just want to get back to the transition costs issue. We started down that path.

Dr. GRIFFIN. We——

Mr. FRELINGHUYSEN. We are familiar with what the GAO says you should have been doing over the last couple of years, reflecting more of those costs in your budget figures. Is there something in the offing in future years?

Dr. GRIFFIN. Well, I am going to let Bill Gerstenmaier comment on transition costs. But broadly speaking, transition costs through fiscal year 2010, are captured in the Shuttle budget, because they form part of the current Shuttle program. After the Shuttle retires, it is our goal to keep those transition costs as low as we can keep them. We are not putting figures out there, which represent an entitlement.

Mr. FRELINGHUYSEN. If we can't put figures out there, because they represent an entitlement, and you are telling us that those figures are within your existing budget?

Dr. GRIFFIN. They are a lien against the Constellation budget.

Mr. FRELINGHUYSEN. Yes.

Dr. GRIFFIN. Okay. So the money is there. It is a lien against the Constellation budget. We obviously desire to keep the transition and retirement figures as low as possible.

Mr. FRELINGHUYSEN. And you are working to drive those costs down.

Dr. GRIFFIN. We are, sir. Bill, do you have any more comments?

Mr. FRELINGHUYSEN. We had quite an extensive discussion with the GAO. And, we are not necessarily buying everything they say. But this is one of those issues that I think is worthy of some public discussion.

Mr. GERSTENMAIER. Again, I would just say as Mike reiterated to you, through FY 2010, it is in the Shuttle budget. Then we have a lien for the transition activities beyond FY 2010. It is our goal to try to drive those down as low as we can. One thing that is nice about the way we are doing business is a lot of our systems will hand over directly to Exploration. For example, our pads will go to Exploration, the Vertical Assembly Building will go to Exploration, our test stands at Stennis will go to Exploration. So the transition costs associated with those are really not very big. I mean, that hardware, those physical facilities, those personnel, they actually transition directly to Exploration.

So what we have been doing is going through very methodically all our facilities, all our major areas, and trying to identify where there is a unique item that actually has to be retired or disposed of. Then we are looking at the most creative and most effective way to do that disposition of that hardware, that physical asset. We are looking at ways to reduce those costs. Several years ago, when we first had our cost estimates, they were fairly large. But we have those. In the first year, we will probably have them again. But now we are at the point, where I think, we have got that budget understood sufficiently through this next budget cycle to bring forward and resolve it with Exploration. But we are motivated to bring that down as low as we can, because for every dollar that we spend on transition costs——

Mr. FRELINGHUYSEN. Yes.

Mr. GERSTENMAIER [continuing]. That is a dollar we do not get to spend on Exploration and doing the things that we really want to go do. So we didn't want to create a program. We didn't want to create a group whose responsibility was to go do that activity until it was absolutely——

Mr. FRELINGHUYSEN. We don't want to drag on your budget. But that is one of those issues.

Mr. GERSTENMAIER. I think we may not have the budget defined as well as GAO would like, as it looks at us. But, if you look at the processes, the procedures we have got in place, the identified work, the amount of discussions, and activities that are occurring, I think it is a very sound program for transition that sits under there.

INDEPENDENT AUDITORS

Mr. FRELINGHUYSEN. Just one last question, which may not be related. The independent auditors that somebody referred to earlier, what— those are independent auditors. I mean, they are, you know, outside auditors that take a look at the——

Dr. GRIFFIN. Yes, sir. They are external industry auditors that——

Mr. FRELINGHUYSEN [continuing]. These are auditors that are intimately familiar, obviously, with this industrial base, or how would you characterize who these people are? Are they firms? Are they contracts?

Dr. GRIFFIN. Well, I know who it is. I mean I didn't necessarily want to say names. Ernst & Young are our——

Mr. FRELINGHUYSEN. Yes.

Dr. GRIFFIN [continuing]. Independent auditors.

Mr. FRELINGHUYSEN. No harm in giving them——

Dr. GRIFFIN. Okay.

Mr. FRELINGHUYSEN [continuing]. In making that public.

Dr. GRIFFIN. We have been working with them for years. Again, when I came to NASA, we were in a position where our financial status, in terms of our quality of our audits, was red. We have worked over the past three years to improve that. The current position that we are in is that everything is pretty much okay, except for property management. Specifically in property management, the Space Shuttle assets that have been acquired over 35 years.

Mr. FRELINGHUYSEN. This is a lot of stuff.

Dr. GRIFFIN. It is an awful lot of stuff. As we write it off our books——

Mr. FRELINGHUYSEN. And it is all over the place.

Dr. GRIFFIN [continuing]. Exactly right, sir. So it is all over the place geographically. It is an awful lot of stuff. It is three-and-a-half decades old in heritage. Frankly, if it wasn't book kept properly at the time, and it wasn't, I can't fix it retroactively. Even our auditors agree that we can't fix it retroactively. So what we have to do, going forward, utilize the property management system that we have in place for all new assets. As we retire the Shuttle, we have to write these things off our books and dispose of it in that way. Then we will finally, finally have a clean audit opinion.

Mr. FRELINGHUYSEN. Great. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Mr. Schiff.

Mr. SCHIFF. Mr. Chairman, I was wrong about the order. So please I defer to my Chairman.

Mr. MOLLOHAN. No, no, no. Mr. Schiff, go ahead. I insist.

OVERALL BUDGET CUTS

Mr. SCHIFF. It is not good to supersede the Chairman. I had a couple of quick questions that I wanted to pose, and I know we have to run off to vote.

This gets back in part to the Chairman's comment about what cuts are necessitated by the overall size of the budget. I am sure that it wasn't the intent of the National Academy in giving Mars Program an A and Earth Sciences a D, to bring all the programs down or up to a B minus by cutting funding for one to augment funding for another. I am sure that was not their intent. And I wouldn't want to see us go in that direction. I do appreciate what you are doing in the Earth Sciences. I think it is necessary and desirable.

I think it does get back to the Chairman's point though that we need to make a broader investment so we can get A's on everything, but I do want to compliment you on the Earth Sciences work. I particularly appreciate the investment in SMAP and the scheduled launch in fiscal year 2012, the other missions recommended for the Earth Science, and the CATO Review thereafter.

PLUTONIUM AND THE IMPLEMENTATION OF HSPD–12

One of the two questions I want to ask is on the issue of plutonium. We are heavily reliant on the Russians to get our people into space, and we are also heavily reliant on them with plutonium.

I am interested to know how much are we paying Russia for this. I also know there was a study commissioned in our last Appropriations bill to have the National Research Council conduct the review of what our nuclear power needs are for NASA missions, so if you could comment on that.

The other issue that is quite unique—well, not unique to JPL but it is very significant in JPL. I know as you know many of the staff at JPL are concerned with NASA's implementation of HSPD–12. Some have filed suit, and I am not going to ask you to comment on the litigation.

I do understand that other federal agencies, including the Energy Department and the National Science Foundation have interpreted HSPD–12 in a way that doesn't mandate contractors working on non-sensitive work to comply with HSPD–12. I would be interested to know why NASA is interpreting this directive differently than these other agencies.

Dr. GRIFFIN. I am sorry. I have to say that I can't tell you why NASA or why other agencies are interpreting HSPD–12's requirements as they are.

NASA's plan was carefully reviewed with Justice Department and OPM before going forward with it. So we think our plan complies with the law. Of course, you are aware there is a legal challenge ongoing at the moment to decide whether or not that is true.

Mr. SCHIFF. I would assume those other agencies also——

Dr. GRIFFIN. I——

Mr. SCHIFF [continuing]. Conferred with Justice to make sure what they were doing was appropriate. I would like to follow up with you if I can and with the other agencies. I understand you are trying to comply with the law, but I think that we may be asking employees for information that we don't need. We are working on matters that aren't sensitive, and perhaps the other agencies have a more appropriate application of that directive.

Dr. GRIFFIN. Possibly. The matter is under litigation. What I can say is limited. But it would not surprise me if other agencies believed that what they were doing was not necessarily very sensitive. Whereas those who touch information technology facilities and aerospace facilities, as you know, aerospace technology is more carefully controlled than other technologies in this country. We have ITAR and export control limitations that specifically apply to aerospace technologies that do not apply to other sectors.

So it would not surprise me that the details of working at JPL require a determination that employees are in more sensitive positions than might be the case for other agencies.

We are not trying to impose any requirements beyond what we believe the law requires for HSPD–12.

Mr. SCHIFF. I am sure that frankly there are people at the Energy Department that are working on sensitive national security issues that are of equal significance as those being done at JPL. I will follow up with you on that.

If either of you have time to make a quick comment on the plutonium issue. Then I know we need to——

Dr. GRIFFIN. Yes, sir, I can. In 1988, the United States made a conscious decision to stop producing plutonium 238. Now since that time, DOE has been able to maintain a capability to refine it but not to produce new stuff and to encapsulate existing plutonium that we get, for example, from Russia. Now under the Atomic Energy Act, DOE, not NASA, is responsible for producing plutonium for all Federal government users, including NASA, but for all government users. So we have been using so far the plutonium 238 in the inventory. We are basically, you know, nearly out of that. It is not enough, after the Mars Science Laboratory, launches down at JPL, we are basically out of plutonium for—sorry, you are shaking your head.

Mr. STERN. But we do have sufficient plutonium in the inventory for MSL, the stuff Dr. Griffin just mentioned, in addition for the outer planet flagship. For one additional small nuclear mission, Discovery demonstration of new nuclear technology.

Mr. SCHIFF. If I could, I will follow up with you both on this tomorrow.

Dr. GRIFFIN. Okay.

Mr. SCHIFF. I don't want my Chairman and Ranking Member to miss a vote on my account. That is the last thing I want to do.

Dr. GRIFFIN. Oh, okay.

Mr. SCHIFF. But thank you.

Dr. GRIFFIN. Anyway, looking ahead, plutonium is in short supply. We will talk to you about that tomorrow.

Mr. MOLLOHAN. Doctor, we have four votes in a series of votes. That will take us probably until about—we couldn't resume till about 4:30. So we are going to recess the hearing until tomorrow at 10:00. And we will reassemble at B–313 in the Rayburn— I am sorry, B–318 in the Rayburn Building.

Thank you for your testimony here this afternoon.

Dr. GRIFFIN. Thank you, sir. We will see you tomorrow in Rayburn B–318.

Mr. MOLLOHAN. So we are in recess.

THURSDAY, MARCH 6, 2008.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

WITNESS

MICHAEL D. GRIFFIN, NASA ADMINISTRATOR

PLUTONIUM-238

Mr. MOLLOHAN. The hearing will resume. And we would like to welcome back this morning Dr. Griffin and the NASA panel, welcome. Thank you all for returning.

Let me ask the Administrator if he will elaborate, if he needs to, on the question Mr. Schiff asked at the end of the hearing yesterday when we had to go for a vote regarding the availability of plutonium. I think you may have been in the middle of an answer, Doctor, and if you want to answer here before us or for the record, we would like to give you an opportunity to elaborate.

Dr. GRIFFIN. Thank you sir, yes, we were right in the middle of answering that question when the call for a vote came, and so I think we left you hanging. Let me tie a bow around that if I might. I will provide a full answer for the written record. But briefly the situation is that we shut down plutonium-238 production for space power sources in 1988 as a matter of national policy at that time. We had a substantial inventory in the United States. That inventory has been gradually depleted. We have made purchases from Russia, from their plutonium inventory. They have advised us that they are down to their last 10 kilograms of plutonium. So between U.S. and Russian inventories, we are now foreseeing the end of that production line. We, at this point, have only the capability in the United States to refine existing plutonium-238. We cannot make new material. NASA has enough available now for the next Discovery mission and the outer planets flagship that I spoke of yesterday that is a high priority for the Academy of Sciences. When those missions are allocated, we have no more.

It takes about seven years to bring new plutonium-238 production on line from the day we start. I would remind everybody that plutonium production is not a NASA charter. That is a DOE responsibility. But we are told by DOE that it takes about seven years to bring capability on line from the start. So therefore, if we were to start sometime in Fiscal Year 2009, the earliest date we could have new plutonium for space power applications would be 2016, around the time we would like to be starting Mars sample return or another Mars Rover mission, which would need such plutonium. And in any case, if we want to do any scientific missions past the orbit of Mars, we would need new plutonium. So the Planetary Science Program would be severely hampered if we do not get that production restarted.

Now again, I would remind everybody that NASA is a customer in this, not a supplier. It is not our facilities or our production or our production money; we would need, at the national level, to get DOE to restart that production. More of the details I would like to furnish for the record. So I think that finishes up Mr. Schiff's question.

[The information follows:]

PLUTONIUM-238

The Department of Energy (DOE) and NASA have worked closely together to assure that the missions identified in the FY 2009 budget request have adequate Plutonium (Pu-238) by using any domestically stockpiled Pu-238 and augmenting the supply with Russian produced Pu-238.

NASA is currently using DOE's contract with the Russians for the purchase of Pu-238.

NASA relies on DOE's contract with the Russians for the purchase of Pu-238. NASA is in the process of purchasing 10 kg of Pu-238 from Russia suppliers. Five kg will be purchased before the end of FY 2008 and five more in FY 2009, even though NASA will not use this supply for a number of years. By purchasing the Pu-238 as early as possible, then NASA is comfortable with moving ahead with its plans for missions that will require Pu-238 heat-conversion power systems.

NASA is evaluating the need for nuclear energy sources for the lunar surface. While it is still formulating its lunar architectural needs, NASA is considering that Radioisotope Power Systems may provide an important power source for enabling mobility for human explorers on the lunar surface. NASA Exploration Systems Mission Directorate will work with the Science Mission Directorate and the Office of the Chief Engineer to develop an overall Agency strategy to engage the DOE to acquire the Plutonium-238 that may be needed to meet NASA needs.

NASA's exploration technology development program also has a Fission Surface Power Systems project that is examining technologies that might enable the development of a nuclear fission reactor for potential use on the lunar surface. The fission surface power system project would utilize uranium, not Pu-238, as the nuclear fuel.

Mr. MOLLOHAN. What are the timelines involved with that? You are able to do what you——

Dr. GRIFFIN. Well, the Outer Planets Flagship would fly when, Alan?

Dr. STERN. 2016 or 2017 depending on the final choice of target.

Dr. GRIFFIN. The next Discovery mission that we have completed would be 2013?

Dr. STERN. 2013–2014.

Dr. GRIFFIN. 2013–2014, right. So we would fly a mission in 2013 or 2014, and another in 2016 or 2017 with the inventory we have, and after that there will be no more. Obviously that is an issue for our Science Program.

AMERICAN COMPETITIVENESS INITIATIVE

Mr. MOLLOHAN. Thank you. You know, everybody understands that you have worked very hard to ration your resources in a way that allows you to do the vision and then to fulfill the other missions that NASA is charged with fulfilling. A lot of people would like to have more resources for NASA to spend more money, and not only on the exploration activities but on science and education and aeronautics, principally. But the requests forthcoming from the Administration do not seem to be responsive to that, so we have to conclude that the Administration does not agree with that. But certainly the Congress has, and the President has signed the America Competes Act. And it clearly states that NASA should be a full participant in any interagency effort to promote innovation and economic competitiveness, which was the focus of that.

Your budget request cuts aeronautics, cuts science, cuts education; I think I am right in all of that. And NASA Science Programs, am I wrong in that?

Dr. GRIFFIN. I do not think we cut Science, sir.

Mr. MOLLOHAN. Science is not cut? It is flat. It is flat out the next several years, yes. But the, so but NASA's programs are not a part of the American Competitiveness Initiative. Is there any reason why NASA programs should not be a part of the American Competitiveness Initiative? Is there some intrinsic aspect to NASA science, NASA research, NASA technology development, that would justify its not being included?

Dr. GRIFFIN. No sir, there is no intrinsic reason for that. In the end, since the President's initiative must be enacted in legislation, it is a judgment that the Congress must finally make. But the rationale on the Administration's part for leaving NASA out of it, and I did have this discussion, was two-pronged. The first was that the kind of science that we do at NASA is not immediately productive of the kinds of results that enhance American competitiveness. It is world class science, by any measure. But it does not result in near-term enhancements to our economic competitiveness as a nation.

Mr. MOLLOHAN. Really? I mean——

Dr. GRIFFIN. Well, that was the view, sir. I mean, when we do planetary science, when we investigate the geology of Mars; when we study the physics of the sun, those things are extremely interesting and very important to know, but they do not speak directly to economic competitiveness.

Mr. MOLLOHAN. You know, I do not have all the examples in my head but there are a lot of examples that NASA touts that get transferred, the technology that they develop gets transferred, and I know that is a real part of your actual statutory mission is to transfer that technology.

Dr. GRIFFIN. Yes sir, it is.

Mr. MOLLOHAN. I would bet that NASA transfers, I do not know how you would measure this, but I bet NASA transfers more technology over the years than a number of the agencies that are a part of the American Competitiveness. Maybe that is not right, but——

Dr. GRIFFIN. No, that is probably true. Yesterday, Mr. Ruppersberger referred to our research and development missions, and he is not wrong. We do one-of-a-kind things that have never been done before. In the process of inventing those things we invent new technology and new processes, and we do transfer that technology out. So that part does go to American competitiveness.

Mr. MOLLOHAN. And all of the aeronautics activity.

Dr. GRIFFIN. Of course all of the aeronautics activity.

Mr. MOLLOHAN. I mean that is, as I understand it, directly——

Dr. GRIFFIN. Yes, sir. But the other part of the rationale was that NASA is already being well treated within Administration funding. As I have pointed out earlier, NASA's funding from the Administration has been essentially level with inflation, whereas broadly speaking domestic, nonnational security domestic discretionary programs have actually been reduced across the board.

Mr. MOLLOHAN. So there are two rationales. The first one we do not have to necessarily completely agree with.

Dr. GRIFFIN. Correct. And the second one is——

Mr. MOLLOHAN. The second one is relative and——

Dr. GRIFFIN. It is a matter of——

Mr. MOLLOHAN [continuing]. It does not mean this funding is adequate.

Dr. GRIFFIN. Correct. The ACI, as proposed by the President, was intended to address those agencies where funding was perceived not to be adequate. Now, again, it is the judgment of the Congress as to what is adequate and what agency should or should not be included in the initiative, and we understand that. But if you ask why NASA was not initially included in the ACI, it was because of those two reasons.

Mr. MOLLOHAN. I think it makes an additional very good argument, and a politically correct argument at this point in time, to talk about NASA's contribution to American competitiveness and argue that it should be a part of the American Competitiveness Program. If not initiated from the Administration, a good argument is for the Congress to consider additional funding for that purpose. Mr. Frelinghuysen?

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman, good morning.

GAO ACCOUNTABILITY

Mr. MOLLOHAN. Good morning, Mr. Frelinghuysen. As I mentioned yesterday, we heard testimony last week from the GAO on what they see as the highest areas of challenge and risk for NASA. I would like your reaction to what they had to say, and to summarize their overall assessment, which is not necessarily mine. I would like your reaction. I must say to be cooped up with them for a couple of hours and for them to go over your budget, I am not sure I would wish that on anybody. But it was an interesting exercise and I learned a lot. And so here we go here. Your large scale projects are costing more and taking longer to delivery than earlier envisioned. You are pursuing more projects than you can afford over the long term. And estimates for the Constellation Programs and International Space Station are highly optimistic and unreliable. How would you respond? Do you agree that those are the foremost challenges you are facing? And if so, what NASA is doing on addressing those challenges?

I am not doing this to irritate you. And I understand, you embody risk taking, exploration. GAO embodies, and I am not knocking it, predictability, green eye shades, you know, supra analysis. I would like your reaction, overall reaction to their views.

Dr. GRIFFIN. Thank you, sir. I am sorry if my body language conveyed irritation. You actually have a constitutional right to irritate me, so feel free.

Mr. FRELINGHUYSEN. No, no. These are questions that are out there. If you look at the GAO report, they are substantive. And we have sort of got, you know, the camel's nose under the tent a little bit yesterday. And I think you should have an opportunity to respond and react.

Dr. GRIFFIN. Thank you. Let me try to do that. First of all, I flat disagree with those assessments. Specifically to Constellation, we are at the early stages of the Constellation Program with several goals. The first is to replace the Space Shuttle as a means of access to Earth orbital space by U.S. astronauts. Then from there, we proceed to the Moon. Now, obviously we are not into the lunar construction phase yet. We are into the phase of constructing systems to replace the shuttle. Yesterday, prior to coming to this hearing, I was in a budgetary and programmatic review on a piece of that system. It is going extremely well. Its contracts have now been let. Excellent progress is being made. We are a couple of years into the program. We are not seeing, nor are we forecasting, overruns. We are not having major technical problems. We are having minor technical problems that one expects in a development program. The programs are going as well as anything I have seen. I have been in this business for 37 years to this point. These programs are large programs, and at this stage of the game they are going very well. The early stages of a program are the most dangerous. The period of time when you are setting them up and beginning execution is when you sow the potential seeds for trouble later on. I think the folks who are executing them are doing very well.

We are, at NASA, for the first time in NASA's history, now using statistical budget estimation tools, and we are giving these estimates to Congress. We are giving Congress and our key appropriations and oversight committees schedule estimates that are budgeted at the 65 percent confidence level consistently across the board on Constellation programs, and that is a major improvement in the quality and predictability which the GAO seeks. We are giving you a major improvement in the quality and predictability of our budget estimates. We are telling your staff, and our other stakeholders, exactly how we are arriving at those estimates and what they mean.

When it is said that our large programs are slipping and are over budget, there are two of those that I can think of that would fit in that category, but I do not regard either program slippage as fatal or even close to it. One is the James Webb Space Telescope. In my first days as the new Administrator three years ago, my management team was presented with an overrun for James Webb. The Program was originally scoped at $2.2 billion and we received a $1.4 billion increase. We budgeted within the NASA Science Program, we deferred some other missions to fix James Webb's budgetary problems, which, I will emphasize, do not reflect a failure of execution on the part of the James Webb Telescope team. Phil Sabelhaus, one of the best program managers we have, works at Goddard. The Program is going well. It was under-budgeted. It is not being poorly executed, it was under-budgeted. We fixed that.

The Mars Science Laboratory is experiencing a cost growth as they approach spacecraft integration. In Senator Nelson's hearing yesterday I indicated the cost growth was about $175 million. If that changes we will let you know. It is a $1 billion program. It is a planetary flagship mission. It does things that never before have been done. The cost growth, while regrettable, is understandable. Again, I look at the project. The project is not doing anything wrong. The initial budget estimates, made years before my time, may well not have been as accurate as they could have been so when the GAO talks about cost growth, what I want to talk about is obtaining more realistic estimates.

REBASELINED PROJECTS

Mr. FRELINGHUYSEN. They are critical of what they call your use of rebaselining and obviously there are appropriate reasons for that. Where is it appropriate?

Dr. GRIFFIN. If we believe that a program has changed sufficiently in its budgetary estimates and schedule projections the old ones are no longer relevant, we try to explain to you what we are doing, then yes, we do rebaseline the program.

Mr. FRELINGHUYSEN. They seem to feel that the practice of rebaselining is being overused to the point where it becomes impossible for them or anyone else to assess how much a project has deviated from its original estimate. And if you look at the original estimates, I mean in some cases they are minimal. Maybe they were underestimated.

Dr. GRIFFIN. I think that is often the case. I have worked very hard over the past three years to put a stop to the practice, and I think our team at NASA is fully subscribed to producing for you better estimates so that rebaselining can be reduced.

Mr. FRELINGHUYSEN. Could you talk a little bit——

Dr. GRIFFIN. In any case, we are completely transparent about what we are doing.

Mr. FRELINGHUYSEN. I am sure you are. Can you explain when and why you rebaseline projects? And what have you done to improve your original cost estimates and to improve the transparency of deviations from those estimates?

Dr. GRIFFIN. When and why we would rebaseline generally comes to what I said just a moment ago. Let me expand on that a little bit. If we think in the course of execution, if a project has deviated sufficiently, and it is a soft criteria, but if it has deviated sufficiently from its initial ground rules and assumptions as to schedule and cost, or maybe technical content that it will deliver, then it no longer becomes productive to track deviations from the original baseline and we need a new plan.

Mr. FRELINGHUYSEN. Well sometimes, when you have a new plan the original figure sort of goes off into history and it gets forgotten, except I guess by GAO.

Dr. GRIFFIN. I regret that. We keep track of it, and I regret it if that is regarded as a loss of transparency but that is not the intent.

Mr. FRELINGHUYSEN. Well, I serve on the Defense Committee. These types of things happen all the time for defense programs, that somehow GAO has a better way of tracking just defense programs and the development of different platforms than they do.

Dr. GRIFFIN. It actually happens less often with us.

Mr. FRELINGHUYSEN. Yes.

Dr. GRIFFIN. Now, as to what we have done to try to get a handle on that, again, I think the adoption of probabilistic budget estimation techniques with delivery dates at a consistent competence level, as well as explaining that to Committee staff and working with folks, affords an entirely new level of transparency to our budgeting process and cost control, which we have never had at NASA.

INDEPENDENT COST ESTIMATES

Mr. FRELINGHUYSEN. When and under what circumstances do you get independent cost estimates?

Dr. GRIFFIN. On the establishment of any new program, at any rebaselining exercise that is necessary, and we track programs continuously throughout their life cycle with independent cost estimates.

Mr. FRELINGHUYSEN. Well, GAO did recommend the adoption of new cost estimating best practices to you.

Dr. GRIFFIN. Which we are doing.

Mr. FRELINGHUYSEN. Yes, which you are doing. And are you including tracking the original estimates through the life of the program? Is that being done?

Dr. GRIFFIN. We certainly track the original program estimates through the life cycle. We absolutely do know internally how the programs have grown with respect to the original cost estimates and we try to understand why they have grown so that we can avoid whatever mistake was made in the future. Sometimes it is an execution mistake. I made reference yesterday to the APS sensor on the Glory Mission.

Mr. FRELINGHUYSEN. Yes.

Dr. GRIFFIN. That particular sensor is very late and it is causing cost growth throughout the program. We have tracked that and we understand it. We are monitoring it and we are working with the contractor to fix it. Other times, no one has done anything wrong, but the original estimate was low. We want to understand that because it is our goal to produce better estimates. This is not a one size fits all——

Mr. FRELINGHUYSEN. I understand that.

Dr. GRIFFIN [continuing]. Kind of a scenario. There can be different reasons for cost growths. For example, a year ago we got a Continuing Resolution, which meant that some programs which were counting on additional money, had to be delayed a bit.

Mr. FRELINGHUYSEN. Yes.

Dr. GRIFFIN. When you delay a Program you increase the cost.

Mr. FRELINGHUYSEN. You mentioned stability is so essential to your critical mass of all of these programs.

Dr. GRIFFIN. One of the best examples of how NASA is able to control costs occurred more than 15 years ago on one of our largest efforts, when we replaced the Shuttle *Challenger* which was lost in 1986. In the late 1980's we replaced it with Shuttle *Endeavor*. The money for *Endeavor* was appropriated all at one time and the project finished ahead of time and under budget. When we have stability of requirements and stability of funding and stability of purpose, we are able to perform and we are able to perform well.

Mr. FRELINGHUYSEN. Well those were the, I will not say the good old days, when there was more money available so now we are counting on you to do more, apparently, with a lot less. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Thank you, Mr. Frelinghuysen. Mr. Aderholt.

ADEQUATE FUNDING FOR EXPLORATION

Mr. ADERHOLT. Thank you, Mr. Chairman. Thank you, Administrator, for being here. Thank you for your time before the Committee. One thing that I wanted to just inquire about and you may have, you have alluded to it a little bit but I did want to follow up and maybe asked a little bit more about it, was the concern about NASA and its request for adequate funding for exploration to return to the expected launch date of Ares I in 2014. And it looks like the request for the funding for that was not as much as many of us would have liked to have seen. It appears that the requested funding for the fiscal year 2009 is the same as was projected over a year ago before the fiscal year 2007 CR reduced the funding by $500 million. Given that it is critically important to minimize the gap between the shuttle's retirement and Ares beginning, I just wanted to know your thoughts and how you would respond to NASA's not being increased to the amount, or the request being increased to the amount, to compensate for the lost money that was from the fiscal year 2009 CR. Or I am sorry, the fiscal year 2007 CR.

Dr. GRIFFIN. Yes sir, I understood what you meant. Thank you. The only thing I can say is I serve the President and I support the President's budget. Extensive discussions were held within the Administration on whether we would request the additional money to compensate for the delay introduced by the CR into the Exploration Systems development. The final decision was that the Nation has other priorities which outweigh that, so the request for additional funding to counteract the effects of the CR in 2007 was not made. So the Administration chose to accept the 6-month delay to the Shuttle replacement systems, Orion and Ares, rather than request the extra funding to compensate the CR.

Mr. ADERHOLT. So basically this in no way minimizes the cut that happened in fiscal year 2007. The cut that did occur is something that is there and you are by no means saying it is not an issue that has to be dealt with, it is just this is the way that you all chose to move forward at this time?

Dr. GRIFFIN. That is correct, sir. The choice was made to accept the damage which was done.

Mr. ADERHOLT. But still recognize the damage is there?

Dr. GRIFFIN. Still recognizing that it is damaging, yes sir, of course.

U.S. PRESENCE ON THE MOON

Mr. ADERHOLT. I have heard that there are some rare minerals on the Moon that may provide further justification for building some kind of permanent outpost there. Just if you could take a second and talk about what a permanent presence on the Moon would mean, and would mining be a part of that, and I will just open it up to get your thoughts on that.

Dr. GRIFFIN. Well, certainly I am one of those who leads the parade in believing in a permanent U.S. presence on the Moon in the form of an initially small outpost. I would urge you to think about something like Antarctica back in the 1950's, when we first returned people to Antarctica and had them stay for long periods of time. So think about a scientific outpost, a research base, something small to start with. But, I think that that is important for the Nation, because our purpose with the Space Program is to take the range of human action, human thought and human experience outward into the Solar System. That is what we do with NASA, with our people and our robotic probes.

Now specifically to the issue of lunar resources, lunar resources do not have economic value on Earth. The expense of transporting them back would outweigh any value they had. The value of lunar resources such as we might find there, is to reduce the dependency of such an outpost from shipping material up from Earth. For example, the lunar crust is, depending on where you are, 15 to 40 percent oxygen by weight. So one of the first things that a crew on a lunar outpost would do, we would hope, would be to learn to extract oxygen from the lunar soil by heating it up and capturing the effluent. There are also other gases that they would capture that would be useful in lesser quantity, but oxygen is one of the main ones.

The sooner that we start doing things like that, the sooner we can reduce our dependency on a logistics train from Earth to support such an outpost. So yes, an early focus on our Program would be learning to use lunar materials, not from the point of view of their value on Earth, but from the point of view of their value on the Moon in enabling more robust exploration and utilization of the Moon itself.

Mr. ADERHOLT. Thank you. That is all I have, Mr. Chairman, thank you.

Dr. GRIFFIN. Thank you, sir.

CORE VISIONS/CONSTRAINED BUDGETS

Mr. MOLLOHAN. Thank you, Mr. Aderholt. Dr. Griffin, how is NASA able to meet the time tables presented with in the President's vision and meet its other core visions within these constrained budgets? Something has to give, does it not?

Dr. GRIFFIN. Well sir, things have given. As I pointed out yesterday, this, of course, calls for a conclusion of the witness, but I am your witness and so I will give you my conclusions. I think with regard to our core programs—finishing up Space Station and utilizing it, building new systems to replace the Shuttle and then return to the Moon, our Science Portfolio with its four individual portfolios, and our Aeronautics Program—I believe that all of those are strategically going in the right direction. I do. So when you address the issue of funding, how is it possible to keep them on track? Well, they are on track. They are going in the right direction. They are doing the right things. People will quibble at the margin, things like we should be doing a little more Mars or a little less Mars, or a little more outer planets or less outer planets. Those will be quibbles that we should have. The community should debate one thing versus another. But broadly speaking, I think we are going in the right direction. We are on the right track.

So now the question becomes how fast do you move down the track? That is funding driven. I cannot argue with you. When you say that, if more money were supplied, we could do more and have it more quickly, you are correct. But we also have within the Nation many other priorities, and they also must be paced with the available funding. So this Administration has chosen a pace of accomplishment which we believe is acceptable. The funding that we are requesting in FY 2009 and beyond allows us to accomplish the things that the President is asking us to accomplish and that this Congress has authorized and approved, at a pace which is judged to be adequate.

SPACE TRANSPORTATION GAP

Mr. MOLLOHAN. Well you know, you have expressed considerable concern about the gap that is going to exist with regard to the transportation, unavailability of a transportation system to access the Station and otherwise. So I would like to talk about that just a little bit. We visited on that and for the record, let me read you a quote. This is out of a NASA document. The title of this is Resources to Implement the Vision Have Eroded. And it does a computation here, it all adds up to $11.7 billion and in a box it says, "The cumulative effects of $11.7 billion in reductions and costs absorbed in NASA's budget since the vision for space exploration was announced is the overriding reason why NASA cannot develop the Orion Ares I by 2014 and can afford only those robotic lunar missions absolutely necessary to support future human exploration activities." Could you comment on that? This is your——

Dr. GRIFFIN. Yes, it is a document with which I am familiar that was prepared by staff. I have mentioned on several occasions that we do have discussions within the Administration as to what the budget request should be and what we should try to accomplish with it. That was a document which was prepared to support those discussions and it does reference the fact that, if you will, the buying power available to us in the Agency has eroded over the last few years by that figure that you quoted.

A substantial portion of that figure was manifested, when I arrived at NASA, and I noted that the Shuttle and Station programs had been underfunded to complete the President's direction to finish the Space Station. We had place holders in the budget for Shuttle and Station, and the difference between the place holders and what was really needed was about $5.5 billion. Additionally, we lost some top line budget authority in the Fiscal Year 2006 budget submission and then there was the Hubble Space Telescope Servicing Mission, Hurricane Katrina, and a few other things, all of which added up to the $11.7 billion that is in the document. So that was a document prepared to support those discussions. Now in the end I am permitted to discuss, and I am certainly permitted to make my arguments, but I do not win every argument.

Mr. MOLLOHAN. No, absolutely.

Dr. GRIFFIN. So the decision ultimately was made that the Nation has other priorities that are more significant than to restore that $11.7 billion in funding.

Mr. MOLLOHAN. This document was generated in house——

Dr. GRIFFIN. It is an internal document.

Mr. MOLLOHAN [continuing]. To justify your deliberations within?

Dr. GRIFFIN. It was an internal document generated to quantify what has happened over the last few years to support my deliberations within the administration, and that is all it is.

CONSTELLATION CONFIDENCE LEVEL

Mr. MOLLOHAN. Yes, okay. Let me just use that to talk about the gap in the availability of Constellation and what timeline we are talking about. I believe you had some testimony on the Senate side just recently about that with Senator Nelson?

Dr. GRIFFIN. Yes, sir.

Mr. MOLLOHAN. And you talked about if you had additional resources perhaps the confidence level of completing Constellation, getting Ares and Orion operational, could be accelerated with a certain level of confidence. Could you just discuss that?

Dr. GRIFFIN. Yes, sir.

Mr. MOLLOHAN. If you had additional funding and how much, could you accelerate its availability and with what degree of certainty?

Dr. GRIFFIN. Yes, sir. This is a question I have now been asked so often that I——

Mr. MOLLOHAN. I am sure you are tired of answering it.

Dr. GRIFFIN. I probably have the answer memorized so I can give it to you fairly expeditiously. We are with 65 percent confidence, using our statistical budget estimating tools that I spoke of, more modern cost estimation methods that Mr. Frelinghuysen was talking about, with 65 percent confidence we believe that we will deliver Ares and Orion, the Shuttle replacement systems, for first flight by March of 2015.

At that same confidence level, so apples to apples, I was asked by Senator Nelson what is the earliest that that could be delivered. In fact, the first time he asked that question, I believe, was last November in a hearing and then he asked it again in the recent hearing. I said, if things went well technically and we had all of the funding we needed, the system could be delivered by September of 2013, eighteen months earlier. Senator Nelson asked how much that would cost, and I said the total price tag for that was about $2 billion as closely as we can estimate it spread across, at this point, Fiscal Years 2009, 2010, and a little bit in 2011. Very roughly, we have estimated that it is about $100 million to accelerate schedule by one month. You reach a limit on that when you just cannot get things done any more quickly, and that would be the September of 2013 limit.

Now we have recently reexamined that, to make sure that our figures were as accurate as we could make them and our estimates were as good as they could be, and we still stand by that estimate. So we have a technical limit that we can reach, and about 18 months earlier than what we are planning today, and the cost of that is about $2 billion spread over three years. I am sorry, did I answer your question adequately, sir?

Mr. MOLLOHAN. You did. So if you were to be able to apply $2 billion more to this program with a 65 percent level of confidence you could accelerate its availability by 2013?

Dr. GRIFFIN. That is our best estimate, yes sir.

HUMAN EXPLORATION BEYOND EARTH ORBIT

Mr. MOLLOHAN. I understand that there was a conference at Stanford some time ago with industry groups, advocates for NASA and academia to discuss whether the United States is on the right track in its plans to reach the Moon by 2020, build a long term lunar base there, and eventually send humans to Mars. You have been reported as saying that the questions asked at the conference have been asked, they have been answered, and that it is time to move on and support the program. Is that an accurate characterization of your views? And would you elaborate?

Dr. GRIFFIN. It is, sir, and yes I can elaborate on that. I mentioned just a few moments ago, in response to Mr. Aderholt's question, that I do believe that the Moon is very important, and the most important early target for human exploration beyond Earth orbit once we get the Space Station built. That's not because I believe it, but, because before my time, that opinion was codified into the President's Civil Space Policy for NASA, and the Congress subsequently adopted that goal in the 2005 Authorization Act. So the order is Moon, Mars, and then beyond. So Space Station, Moon, and Mars in that order.

Not everyone shares the view that those are the proper goals and in the proper order. That debate was extensively had. So some of the organizers of that conference believe that the Moon is not interesting. That the Moon is old hat, that we have been there and done that. They would like to see a more expeditious program going directly to Mars. I understand their view. Many of them are old friends of mine. I just do not happen to share that view. Some of the organizers of the conference believe that the Nation's exploration money would be better spent building large telescopes at what is called Sun-Earth L1 Point, the Lagrangian Point, where we can park large instruments and they will stay where they are parked. I, too, find that to be an interesting goal but not one that I would adopt instead of returning to the Moon. So there are differing opinions on what the goals should be, and in an environment of limited funding some goals can be afforded and others cannot. Now a goal that I share with that group is the goal that I believe that the near-Earth asteroids are an important target for exploration. But I would place them in a time place between the Moon and Mars, not instead of the Moon. So the conference was basically a discussion of whether the United States space policy has the right goals in the right order. I think, broadly speaking, we do with small modifications. Some of those folks would disagree. Again, the discussion has been held multiple times. I am sure it will be held again.

Mr. MOLLOHAN. Do we have any asteroid program going right now?

Dr. GRIFFIN. We have a, per Congressional legislation, a small program going to identify—Alan help me, 90 percent of the near-Earth asteroids by what year?

Dr. STERN. This year, by the end of this year.

Dr. GRIFFIN. By the end of this year. Ninety percent of the asteroids larger than one kilometer by the end of this year. You have recently put in some funding to increase that, right? To make sure we meet the goal.

Mr. MOLLOHAN. But that is just finding them and identifying them?

Dr. GRIFFIN. Yes, sir.

Mr. MOLLOHAN. How about accessing them?

Dr. GRIFFIN. The Constellation systems that we are building today can access the near-Earth asteroids, should a subsequent Administration or a subsequent Congress decide that that is a good goal. The systems we are building today can get you there.

Mr. MOLLOHAN. When you said between Moon and Mars, is that what you were referring to? Would be accessing them?

Dr. GRIFFIN. Yes sir, that was. The reason is, it is fairly simple as an engineer. The Moon is three days away. We have a lot to learn. I would like to learn it three days from home. Once we set out for Mars, the first crews to go to Mars will be gone in excess of two and a half years, maybe more.

Mr. MOLLOHAN. If you were going to plan to do that——

Dr. GRIFFIN. The asteroids are in the middle of that. They are months away from home, and so I think a stepped sequence of voyages from home, from days and weeks to months to years is the right way to go.

Mr. MOLLOHAN. That would be a reprogramming, that would be a change in your plans, would it not? If you were to put the asteroids?

Dr. GRIFFIN. It would.

Mr. MOLLOHAN. What would you call that? Asteroid exploration? Asteroid visit? How would you talk about that?

Dr. GRIFFIN. I would just refer to them as destinations.

Mr. MOLLOHAN. Okay. Asteroid destinations. That would cause a change in plans, would it not?

Dr. GRIFFIN. That would.

Mr. MOLLOHAN. Would that affect the budget?

Dr. GRIFFIN. Yes, sir. Over a decade from now, but yes sir.

Mr. MOLLOHAN. Would it affect the budget today——

Dr. GRIFFIN. No.

Mr. MOLLOHAN [continuing]. In terms of planning and——

Dr. GRIFFIN. No. It does not affect anything today or for the next decade because, we are building systems with Constellation that are capable of accessing the inner solar system.

Mr. MOLLOHAN. Would that be a good idea to look at that?

Dr. GRIFFIN. Yes, sir.

Mr. MOLLOHAN. Would it be a good idea to do it, do you think?

Dr. GRIFFIN. Again, I do think the near-Earth asteroids are a legitimate scientifically interesting, productive destination for humankind. I would, on a personal basis, favor including them in our program. Now to actually do anything will be after my tenure. But, if you are asking do I think that that is a useful goal, I do think so.

EXPLORATION ON ARCHITECTURE REVIEW

Mr. MOLLOHAN. Do you plan on any review of the exploration architecture prior to the arrival of the next administration to lay a groundwork for reviews by the next administration?

Dr. GRIFFIN. Well, I think our architecture is firmly in place and shows the right approach. It satisfies all the goals that were specified to us by the Congress and the Administration, and we picked it as the cheapest available approach with the lowest risk. So we think we used good criteria to select it and we think we are there.

Now, our progress in building the systems required by the new space architecture is something we review all the time. We conduct regular reviews of our progress in meeting the goals of that architecture, and, when a new Administration comes in and sends a transition team over to NASA to discuss how we are going, we will be ready, willing, and able to describe for them our progress on those systems.

Mr. MOLLOHAN. Okay. Thank you, Doctor. Dr. Griffin, we are going to recess. We have two votes so we cannot go and leave some people here questioning. So we are going to take a recess probably for about fifteen minutes, and we will return after votes. Thank you all.

Dr. GRIFFIN. We are at your discretion, sir. Thank you.

[Recess.]

SPACE INTERFEROMETRY MISSION (SIM)

Mr. MOLLOHAN. The hearing will resume. Mr. Schiff?

Mr. SCHIFF. Thank you, Mr. Chairman. I wanted to follow up on a couple of questions that we discussed yesterday. First of all, I wanted to follow up on SIM. It is my expectation that a decision on how to proceed with the exoplanet research will be made in time for the fiscal year 2010 start. I expect, I think my Committee colleagues feel very much the same way, that SIM will be given every consideration as it meets all the scientific requirements of the last two decadal surveys. This is not just my opinion. It is a sentiment that was shared by appropriations committees of both the House and the Senate, and by your own advisory committee which believes that the astrometry mission is the way to go. The follow up question I want to ask is, what more do you contemplate that NASA will need to make a decision? And what is your timeline on a decision?

Dr. GRIFFIN. I am going to ask Dr. Stern to comment on that.

Dr. STERN. Good morning. As you know, we are studying a variety of exoplanet experimental techniques that all are meant to achieve the same objectives, SIM being one that is quite mature. But over time, a number of other important contenders have come to the fore. Those studies are now in work, as you are aware, and will finish late next year. There is also the decadal survey currently underway in astrophysics, which will make a specific scientific recommendation from the National Academy as to which approach is preferred.

Mr. SCHIFF. You know, the more that I think we are coalescing on something the more I hear that maybe we are not. We seem to be having the same debate we had last year and the scientific community has repeatedly expressed its support for SIM and in decadal after decadal survey, and then here we are waiting for another survey, another potential opinion. It just gives me great concern that we are going to be in another fight over this. I really do not know what more you are requiring, what more you want. Congress could not have been more clear on the subject. The scientific community could not be more clear on the subject. And I guess I am perplexed.

Dr. GRIFFIN. Well sir, I certainly do not want to have a fight over SIM. If the Congress legislates that we do SIM, then we will do

SIM. Now the Administration has not requested it but I can ask them to do that. But I need to be honest. SIM was prioritized high in the last decadal survey, when it was assumed to be a $250 million mission. Today it is presumed to be a $1.6 billion mission. We do not have those funds in the budget. We have discussed this, those funds are not available without killing most of the rest of the astrophysics portfolio.

When you say that the astrophysics community supports SIM, that is not the input that we are getting from the astrophysics community through the committees which advise NASA and the Congress. That is simply not the input that we are getting. They do not want to see this kind of damage done to the astrophysics portfolio in order to favor one mission. So we have been working with your office, and I will continue to do so, to find a way to accomplish the goals of exoplanet research without having to do the full SIM mission with all of the cost that that entails. Now, if that is what the Congress directs us to do then we will do it. But, this year we would like to study some alternatives to come back and talk to you about.

Mr. SCHIFF. Dr. Griffin, this kind of hearkens back to your comments at a conference a few months ago. It is not support for SIM that is jeopardizing any other project. It is rather, in my view, coming in with a budget that is wholly inadequate to do the science that we want to do and that the President has set our goals to do. I do not think it is helpful to create an artificial competition over this issue. The scientific community has been very supportive of SIM. This Congress has been very supportive of SIM. I thought we had a concept of SIM that brought the cost down to $1 billion or less that was manageable within NASA's budget. I thought that was the operating assumption we were acting on. If this is being completely revisited again then I think I and the other members of the Committee need to know about it. We are willing to work with NASA to scale down a version of SIM that is affordable, that can fit within the portfolio, but I need some sense from NASA that this is a priority of yours and that we are not simply throwing this open again to delay and having launch dates slip into the distance, and killing this with a thousand lashes.

Dr. GRIFFIN. I am sorry the budget is not adequate to support the doing of all that folks would like to be done. I understand that you wish the Administration had requested more. When we look at SIM Light, the mission that you are referring to, the question logically arises, whether SIM Light would accomplish most of but not all of the goals of the full SIM mission. Given that that is the level of accomplishment we now strive for with this first exoplanets mission, would there be another technology which would do as well for less money?

The question is not whether JPL will get to lead this mission. They will. The question is not whether an exoplanet mission is important to us. It is. The question is not whether it is a huge priority to us. It is. The question is whether the SIM technology is the best technology, given all that we know today, to accomplish those goals at JPL. I am trying as hard as I possibly can to do this on, an objective, impartial basis in a way that is affordable within the budgets that I am told that I can expect. If we implement SIM as it stands today it will create a very substantial amount of collateral damage to other astrophysics missions in the portfolio, some of which are also of interest to JPL. So we are looking for objective, rational alternatives that we can share with your office.

Mr. SCHIFF. And your analysis of the objectively rational alternatives will be completed in time for a 2010 start?

Dr. GRIFFIN. We will complete it in time for a 2010 start.

MARS PROGRAM

Mr. SCHIFF. Let me turn while I have some time remaining to Mars. As I mentioned yesterday, I am concerned about addressing programs with a D by bringing down those that have received an A.

I think there was a very effective op-ed on the subject of the Mars program by Robert Braun in the current issue of Space News. It is an article entitled “Future Of Our Mars Exploration Program.” I would ask that that be made a part of the record.

[The Future Of Our Mars Exploration Program Article, Science News, March 2, 2008 follows:]

The Future of Our Mars Exploration Program

< ROBERT D. BRAUN >

Over the past decade, NASA's robotic explorers have opened our eyes to the scientific beauty and dynamic complexity of Mars. At this very hour, the Spirit and Opportunity rovers are continuing their exploration of the surface of Mars; the Phoenix spacecraft is cruising toward a May 2008 landing in the planet's north polar region; and the MRO and Odyssey orbiters continue their global observation campaigns.

Paced by the robotic exploration successes of the past few years, our country has completed the critical first steps of a truly phenomenal exploration adventure. Through these missions we have gained an understanding of Mars' past water environment and the implications for life on the Earth's closest sibling.

NASA's robotic explorers have shown Mars to be a complex and dynamic world, provided intriguing evidence for present-day water on Mars, and offered tantalizing clues regarding the potential that Mars could once have harbored life. Conclusive evidence, gained over the past decade, shows that Mars was once a warmer, wetter planet. However, our understanding of the natural forces that drove Mars' climate change to its present cold, arid state is in its infancy, and the implications to the future of our own planet are unknown.

It is not any one mission or science measurement that has singularly changed our view of Mars. Rather, it is the conglomeration of evidence, gathered through an interconnected set of measurements, obtained by a carefully engineered sequence of science missions. This is the definition of a successful exploration program. Rather than flying a series of independent missions, the Mars program has constructed a system that is greater than the sum of its parts. For example, in addition to their primary science mission, the Mars orbiters serve as communication nodes for the landers and rovers, and provide imagery that allows the selection of safe and scientifically interesting landing sites.

Each mission in the Mars program builds upon the scientific discoveries and the technological breakthroughs that arise from the previous missions. There is continuity of people and processes that enable cost-effective exploration of Mars, with a success rate that belies the inherent risks of these endeavors. To achieve this exploration capability, the Mars program has been funded in the $600 million to $700 million range in recent years, a few percent of NASA's total budget.

On Feb. 4, in stark contrast to the successful performance of the Mars exploration program, NASA announced a significant reduction in the 2009 budget request for Mars exploration. This budget request is not only in direct contradiction to the guidance NASA received in the 2008 Consolidated Appropriations Act, but also is clear evidence of the gutting of what the American people consider one of NASA's most successful programs.

The 2008 Consolidated Appropriations Act, enacted into law in December 2007 states:

"The Appropriations Committees agree with the comments in the House report commending NASA for its robotic Mars program which is one of the agency's most successful programs that has made major scientific discoveries and engaged the public. The Appropriations Committees continue to strongly support a robust Mars Exploration Program with a rate of at least one mission at every opportunity (every 26 months), which is consistent with the administration's fiscal year 2008 request of $625.7 million. Full funding is provided to: continue operating all present missions (Odyssey, Mars Reconnaissance Orbiter, Spirit and Opportunity);

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prepare Phoenix for launch in 2007, Mars Science Lab for a launch in 2009, and Scout in 2011; and to start the definition and development of Mars Science orbiter for launch in 2013, and the Astrobiology Field Lab or mid size rovers for launch in 2016. NASA is expected to continue with the development and launch of the Mars Science Lab."

Funded at $386.5 million, this budget request is well below the 2008 congressionally mandated floor of $626.4 million, and is characterized by a $200 million reduction — about 35 percent — relative to that planned for 2009 in the December 2007 enacted legislation.

Making this request even more alarming is the $350 million proposed five-year annual budget average for Mars exploration, with only $300 million in 2010 — less than one-half of the 2007 Mars program budget. This compares to an average annual budget of about $620 million planned from 2009 to 2012 in last year's NASA budget request.

By removing any semblance of a continuous exploration program, NASA's 2009 budget request puts the Mars program on a path toward irrelevance. The budget requested is simply inadequate to complete the next steps in this remarkable exploration program.

Take a closer look at one likely future. Following the Phoenix landing later this year, the Mars Science Laboratory will be launched in 2009. Beyond this date, the future Mars program consists of: nothing in 2011, a Mars Scout orbiter in 2013, the potential for a modest orbital mission in 2016, nothing in 2018, and the glimmer of hope for an international Mars Sample Return campaign that may begin in 2020.

Of course, since this is a five-year budget request that runs through 2013, there need be essentially no funds for Mars Sample Return development contained within it. This is not a program that will produce the type of compelling science that has been achieved over the past decade. Rather, it is the beginning of the end of what has been a dramatic advancement in our understanding of the Mars system.

This budget request also portends a potential decade gap between Mars Science Laboratory and our next Mars surface mission. NASA Administrator Mike Griffin has spoken eloquently about the ramifications that a gap in human spaceflight would have on the United States. Is this Mars surface exploration gap no less significant or concerning for the scientific and engineering literacy of our country?

And what of the scientific and engineering talent that has been developed over the last decade? These people are currently at the top of their game. However, NASA's 2009 budget request sets into motion a means by which the engineering and science talent that delivered these recent exploration achievements will be lost. Already Mars program personnel at the Jet Propulsion Laboratory and some of the NASA centers are making plans to pursue other endeavors in 2009. As a country, we have invested a great deal of time and effort in these people and the technologies they have advanced.

As an aerospace engineering faculty member, I know firsthand the impact that the Mars program has had on drawing engineering and science students into U.S. universities. I hear the students' stories and dreams of one day being part of the Mars program every day. We have a pipeline of new science and engineering talent just beginning to come into our program. What will continue to inspire them to work to improve the United States' scientific drive, technological leadership and economic edge?

The Mars exploration program is a unique symbol of our country's scientific drive, pioneering spirit and sustained technological interest. Over the past decade, this program has been the strongest and most successful element in NASA's exploration portfolio. The Mars program has addressed scientific questions of fundamental importance, inspired our children, built the scientific and engineering literacy of our country, and increased our economic and technological competitiveness. Now is the time to accelerate, not curtail, the pace and scope of our robotic Mars exploration program.

Robert D. Braun currently serves as the David and Andrew Lewis Associate Professor of Space Technology in the Guggenheim School of Aerospace Engineering at Georgia Institute of Technology. From 1989 to 2003, he worked at the NASA Langley Research Center.

Mr. SCHIFF. Mr. Braun states that by removing all semblance of the continuous exploration program, NASA's 2009 budget request puts the Mars program on a path toward irrelevance. He goes on to state that the program contemplated by the budget request will not produce the type of compelling science that has been achieved over the past decade. Rather, it is the beginning of the end of what has been a dramatic advancement in our understanding of the Mars system.

I think many of us that have looked at the Mars budget are concerned that he is right. I am particularly concerned about the loss of expertise that we will have and I can imagine that those who are working on the program are already pretty disspirited by what looks to them as a significant abandonment of the program.

I, Mr. Chairman, want to work with you and my colleagues on the Committee to make sure that we restore the Mars program and keep it the robust producer of good science and fascination with the space program. However, I want to make my concern about this very clear and want to reiterate today. You are more than welcome to comment on it if you think Mr. Braun's point of view is somehow flawed, but it seems very credible to me. So I want to reiterate that concern.

Dr. STERN. Mr. Schiff, I would like to say a few words about that op-ed which I am familiar with. It is Dr. Braun's opinion. But let me actually explain our Mars program so you understand it. We are flying the Mars Science Lab, as you know. That is planned to launch in 2009. Very high priority from the decadal survey. We are continuing that unabated. In fact, we are supporting it in technical and schedule difficulties. The next mission on our plate is called Mars Aerology and we have two missions competing, one of which will go forward. It is in our plan. That is the number three priority of the Mars portion of the decadal survey. The other priority among the three is Mars Sample Return, which is the place that we have aimed our program subsequent to that aerology mission. So we are actually planning to accomplish all three, three for three of the objectives of the National Academies decadal survey. I do not know how Mr. Braun can refer to our program as deconstructing, or not going after high-priority objectives because we are checking them all off. It will take some time to do that, but we are accomplishing them and accomplishing them in the way that they were described in the decadal survey with the scientific content.

MARS PROGRAM BUDGET

Mr. SCHIFF. What is the percentage cut you made in the Mars program, the projected Mars budget over the next several years, as compared to last year?

Dr. STERN. In the current five-year plan, it is cut about in half. Over the next 10 years, which includes the large amount of funds needed for Mars Sample Return, it is actually not very different than it is right now. It goes down and then comes back.

Mr. SCHIFF. If I could just interject. In the next five years, Mars' budget, compared to what it was last year, is cut in half and you are saying that it will not affect the science, that it will not affect the loss of the talent pool during those five years, that those people will not go elsewhere and how can that be?

Dr. STERN. Let me speak to both parts of your question. First of all, it is very important to realize that Mars Sample Return, as called for by the Mars community, has to be an international endeavor. Our national partner in this is the European Space Agency. In order for them to be a partner in this mission, it needs to occur around the 2020 time frame, not earlier. So our funding and our plan for the Mars Program is what it takes to match our European partner and get the mission done. Were we to try to do it earlier, they would not be able to participate from a financial standpoint.

Mr. SCHIFF. Why is that situation radically different this year than it was last year? I assume you had the same information about European participation last year. It did not seem to be a concern last year. Why has it changed from December to January?

Dr. STERN. In fact, it is different for two reasons. The first is that last year, Mars Sample Return was back-burnered. We have moved it up in priority and gone to Europe, and spoken with the European Space Agency about that. They are as excited as we are to do it. But it is going to take some time to get it back into their budget plan just as it will for ours. The other point that I want to make is that the Mars budget reached a natural high because we are doing the Mars Science Lab, which is a flagship class mission. The Mars budget has varied quite a bit over the last 20 years, up and down. The budget was, in fact, to return toward an average level following the completion of the Mars Science Lab. Now, it has come down more steeply than earlier projections, but it was never planned to sustain at that level in perpetuity.

Mr. SCHIFF. Mr. Chair, I know I am out of time, but one concluding thought on this is if you found a way to do all the science with 50 percent cuts, that will be remarkable for us in the history of NASA and probably the history of the federal government.

That does not seem to me to be enhancing the priority of Mars or, frankly, acknowledging the success of the program. You take a program that has earned an A grade and you cut its budget in half and that ensures that you are going to take an A and turn it into a C. I do not know how you possibly can keep the talent pool alive during the five years and 50 percent cuts.

I look forward to working with my Chair and fellow Committee members to try to deal with this because I think this has been an unmitigated positive in our science program, kept the public interest alive when there have been a lot of setbacks in man space flight, and I would hate to see us put our shining success in the glide path towards an obscure future.

Thank you, Mr. Chairman.

Mr. MOLLOHAN. Mr. Frelinghuysen.

TRANSITION WORKFORCE

Mr. FRELINGHUYSEN. Changing the location quite dramatically. I just want to say I ran into part of your NASA team in Antarctica in late January when they dedicated the new South Pole Station. I know the Chairman has been there.

And I must say what a privilege it was to be there with the National Science Foundation at their invitation and run into quite a lot of your NASA people. We were sort of snowbound for a couple of days in a blizzard, so I got to see quite a few different groups that are out there. Remarkable in many ways, pioneers and explorers in their own right.

And I like the notion, and this sort of gets back to the issue of American preeminence, that you are trying to do the same type of work potentially on the Moon and that you are doing a lot of those same things with the international Space Station. That is a wonderful platform for the type of science we need for generations to come.

I also had a chance to meet Cathy Sullivan, who is unbelievable. It is like putting your finger, wet finger, in a light socket. She is quite a remarkable person. So here I was with Neal Lane, Rita Caldwell, Arden Bement, and then you add in Cathy Sullivan, it was quite a group.

And as the plane was pitching coming back from the South Pole, she was cool as a cucumber as our plane was going up and down. You know, she is one of your remarkable astronauts.

Getting back to more general questions, you are on the brink of some pretty big shifts in your workforce needs with the retirement of the shuttle and the ramp-up of the new constellation system.

Your budget shows the NASA workforce staying level at approximately 17,900 full-time equivalents for the next five years.

What workforce planning have you done to support that request and how confident are you that you can manage the transition with current staffing levels?

Dr. GRIFFIN. I am very confident we can handle the transition with the current staffing levels because, as you know, with regard to Shuttle to Constellation transition, most of the change that occurs is among contractor employees who operate the Shuttle systems, and you are talking about a civil service level.

Mr. FRELINGHUYSEN. The largest fluctuations are in the contractor——

Dr. GRIFFIN. Right.

Mr. FRELINGHUYSEN [continuing]. Community.

Dr. GRIFFIN. So I think our civil service employment will remain just fine. For Fiscal Years 2009 and 2010, we actually fully utilize all the folks we have and could use a few more, but that is okay. Then, as the out years approach, the planning for those gets firmer. So I think our Civil Service workforce planning is in pretty good shape.

CONTRACTOR WORKFORCE

Mr. FRELINGHUYSEN. The contractor community, can you give us an overview as to what sort of changes are in store there? Obviously, there is a lot of apprehension and concern, but what process are you using to sort of manage to do that?

Dr. GRIFFIN. Gerst, do you mind if I turn to you and let you work through this? This is mostly Shuttle and mostly in the area——

Mr. FRELINGHUYSEN. I know you have been doing, what do they call them, workforce mapping exercises and you are about to come up with a report.

Dr. GRIFFIN. Let me mention this just at the top level before I give it to Mr. Gerstenmaier for a couple more details. We owe you on March 24th, a report, and then an update every six months, of our workforce mapping progress across all of our Centers as we transition from Shuttle to Constellation. You will have that. Now, we can give you a few highlights at this point.

Mr. FRELINGHUYSEN. I think that would be valuable——

Dr. GRIFFIN. Good.

Mr. FRELINGHUYSEN [continuing]. If you could do that.

Dr. GRIFFIN. Gerst.

Mr. GERSTENMAIER. We have done a couple of things to try to capture our workforce picture and give employees a sense of the future. We have added some additional line items within our existing contracts that essentially provide another charge code for some of the workers that are going to be working on Constellation. For example, for our solid rocket motors built in Utah, we have a contract line item allowing workers to start doing some work for the Constellation activity ahead of time. So it is actually a transitional workforce. So when they have some down time on their Shuttle activities, they can actually charge to a different charge code that goes to Constellation and actually begin some of that work. So there is ability to do that. We have done a similar kind of thing with some of our processing contracts in Florida. Next year in April or so, we are going to fly the Ares 1–X demonstration flight out of Florida and the folks actually supporting that effort are United Space Alliance employees who are supporting the Shuttle activities. So the employees that actually stack the rockets in the Vertical Assembly Building will do that same work for this demonstration flight. They have a different charge code and a different aspect. So we are able to give them a sense of the future and let them actually start working on some of the new systems while they are still doing their current shuttle work. That has been very effective.

We have also provided some schooling available for——

Mr. FRELINGHUYSEN. So there is schooling and retraining?

Mr. GERSTENMAIER. Yes. We have also provided some schooling and retraining opportunities where, if a discipline is going away—for example, maybe some of the tile technicians we use that place the tile on the bottom of the shuttle—we have given those workers opportunities to go improve their skills in wiring, which will be clearly needed in the future. So we have given them some opportunities to go do things in other areas.

So we have provided hands-on experience to gain future skills and we have also given them some training opportunities to go do that. So far, the workforce is very motivated about what we are doing. This is a very exciting time for us. The changes in Station and Shuttle programs are very dramatic during this period, but workers are also getting a chance to see the future.

NEXT GENERATION

Mr. FRELINGHUYSEN. I want to shift gears while we have Dr. Shin here relative to NextGen. We had a fairly lengthy discussion with the GAO on NextGen.

Can you tell us where we stand relative to NextGen? I know we have this joint planning and development office and you are providing the basic research; is that right?

Mr. SHIN. Yes, sir. Our contribution to JPDO is, as you accurately pointed out, particularly through research. We have made really significant progress last year working with JPDO and all the member agencies there. Most notably, JPDO has released several seminal training documents. One of them is a NextGen research and development plan, and it identifies 163 research needs that need to be addressed. About half of the 163 research needs are associated with NASA. We are not leading all of them. JPDO has identified about 20 percent of them that can be led by NASA.

And so throughout last year——

Mr. FRELINGHUYSEN. Twenty percent of?

Mr. SHIN. Of research needs identified in the NextGen R&D plan. There are all together 163 research needs, sir, in that.

Mr. FRELINGHUYSEN. So which ones would you be in lead on?

Mr. SHIN. Well, we will be working on airspace and ground automation, a lot of concept development, and assuring airport surface optimization can be achieved. Also, one of the backbones of this next encounter is about a trajectory-based operation, meaning that you know the airplane's location any time, anywhere, and you can actually predict how the trajectory of this airplane will be from the departure to arrival.

A lot of automation concepts and algorithms need to be developed. Those are all research needs. NASA is working on all of those. We have gone through a fairly laborious effort of mapping technical milestones to the NextGen R&D plan.

Mr. FRELINGHUYSEN. So how would you characterize the process? How would you assess where you are?

Mr. SHIN. I am happy to report to you, sir, we have not found any gaps. All our technical milestones are addressing the NextGen R&D plan. In December, we also have program reviews for our three research programs and, most notably, the air space systems program, which addresses NextGen 100 percent. The independent review panel, which consisted of a lot of members from FAA and JPDO, gave excellent scores for relevance and quality.

Mr. FRELINGHUYSEN. I do not know whether you are familiar when the GAO testified in their testimony, they did raise some questions about the direction of the joint planning and development office and the interagency effort.

You are familiar with those?

Mr. SHIN. Yes, I am. I am serving as a board member there, and so we meet periodically.

Mr. FRELINGHUYSEN. Well, I know you are. That is excellent.

But their view is that maybe things are not working as smoothly and perhaps as expeditiously as they might——

Mr. SHIN. I think——

Mr. FRELINGHUYSEN [continuing]. And the sense of sort of urgency. Obviously, NASA has lots of priorities. But many members of Congress feel this is something we would rather see sooner rather than later.

Mr. SHIN. As I mentioned earlier, since we have been addressing fundamental research needs of this NextGen capability, we have not really heard that NASA is not working these things expeditiously as possible or slacking. I think the whole enterprise issue, this national air space system issue is very, as you might guess, very complex issue, so——

Mr. FRELINGHUYSEN. It is complicated. It is complicated by the fact that there has been a cut in the money that you have available for your work.

Has not the Earth space systems' budget, which funds research for this type of work, been cut by 25 percent from levels that Congress established in fiscal year 2007 and 2008?

Mr. SHIN. From Fiscal Year 2008 to Fiscal Year 2009, there is roughly a 25 percent reduction, but that is reduction from the Congressional augmentation in Fiscal Year 2008. Of course, we have not seen the 2009——

Mr. FRELINGHUYSEN. Well, the bottom line is when are we going to see something which can be put into effect?

I assume like with a lot of military programs, if you come up with technology out of whatever the spirals are that you are involved in, that that stuff gets, in some ways gets utilized.

Mr. SHIN. Yes. The leverage and——

Mr. FRELINGHUYSEN. Yes.

Mr. SHIN [continuing]. They are important as you point out. DoD is a member agency in JPDO. So we are working very closely with our DoD partners and——

Mr. FRELINGHUYSEN. Have they been fully cooperative?

Mr. SHIN. Yes. We have a very close working relationship with DoD and also Commerce and Homeland Security. So I think NASA's research conservation has been significant in making good progress.

Mr. FRELINGHUYSEN. You are familiar with the GAO's take on where you are?

Mr. SHIN. Yes. I have seen them. Also, last year, there was an audit of JPDO, and we participated in that audit. So I am familiar with GAO's view, sir.

Mr. FRELINGHUYSEN. Okay. Thank you, Mr. Chairman.

DEEP SPACE AND NEAR EARTH NETWORKS

Mr. MOLLOHAN. Thank you, Mr. Frelinghuysen.

Dr. Griffin, when adjustments are made to recognize the transfer of deep space and near Earth networks from heliophysics to space operations, it appears that investments in your Science Mission Directorate are unchanged from the fiscal year 2008 enacted levels. Is that pretty accurate?

Dr. GRIFFIN. Yes, sir.

Mr. MOLLOHAN. How did the Science Mission Directorate manage to accelerate the Earth science decadal missions and quintuple funds for lunar science research without an overall budget increase in science?

Dr. GRIFFIN. Well, money was moved from other portfolios to create the additions that you spoke of. Alan, would you care to comment on the specific sources?

Dr. STERN. Yes, sir. So $570 million was moved within the space science to the Earth science side of the Science Mission Directorate. The Heliophysics Division, Astrophysics Division, and Planetary Divisions each participated in that. Let me be specific about what we did. In the case——

Mr. MOLLOHAN. By program?

Dr. STERN. I am going to go by division, yes, sir.

Mr. MOLLOHAN. Okay.

Dr. STERN. In the case of the Planetary Division, the money that funded the acceleration of the Earth Science program to impact Mars program funds is, as you may recall, there was a difficulty with the current procurement activity on the Mars Scout mission, which caused it to be delayed so that it would have to fly two years later. That meant that we did not have to spend large sums on the development of that mission in 2008 and 2009. There was no other mission to infill that you could do feasibly just starting immediately. Therefore, the Planetary Division elected to make that money, that had become available, its contribution to the Earth Science initiative. So that was a relatively painless way of going about it because of the slippage that had taken place.

In the case of the Heliophysics Division, we made a number of minor adjustments in the program. They are a smaller division and they did not contribute as large an amount. We asked them to contribute proportionately to their size. As you know, we were starting the Solar Probe mission. Solar Probe has been high priority in the decadal survey. What we did was we just stretched out the development of Solar Probe a little bit longer, and moved its launch date to the right so that Heliophysics could have a budget profile that accommodated Earth Science needs.

In the case of Astrophysics, because of the development requirements of missions that are now being built in the Explorer Program (the James Webb Space Telescope, et cetera), Astrophysics was not in a position to contribute in the early years, but the contribution from the Planetary and Heliophysics program were sufficient. So Astrophysics made its contribution in the outyears, primarily in 2011, 2012, 2013 through efficiencies in the operations of missions that are now flying on-orbit observatories.

Mr. MOLLOHAN. Are those all the programs that suffered in order to pay for these increases?

Dr. STERN. Yes, sir, I believe they are.

LUNAR SCIENCE RESEARCH

Mr. MOLLOHAN. Why is the increase of nearly five times necessary for lunar science research? This year, it increases at another 20 percent and most years thereafter.

Dr. STERN. The lunar program that we proposed has two components. The first component was proposed by the President's Fiscal Year 2008 request and was a part of the appropriation that was passed for Fiscal Year 2008. That is a program that began at around the level of $40 million and then went to $60 and $80 million. That was a part of the Fiscal Year 2008 proposal. On top of that now, that provided research and analysis funds as well as for funds to build instruments to fly on the missions of other nations going to the Moon, what we call missions of opportunity where we are a minor partner.

What we proposed in the Fiscal Year 2009 request was to have a lunar science robotic program within the Science Mission Directorate flying small missions in response to the National Academy's lunar science report that was published last year calling for just such a sequence of missions. That is where that second component is. That runs at $60 million a year for three years and then $70 million a year subsequently.

SCIENCE MISSIONS COST GROWTH

Mr. MOLLOHAN. Is there a new policy for containing cost growth on NASA's science missions?

Dr. STERN. Yes, sir.

Mr. MOLLOHAN. What is it?

Dr. STERN. It has three parts. The first part is that we properly scope the missions to fit the budget so that we do not put ourselves in a position of selecting what has been termed, "eight pounds in a five pound bag." That is a part of our selection criteria when we select the mission. We make sure that we are not getting ourselves into trouble to begin with.

Secondly, as Dr. Griffin explained, we treat our reserves differently now using statistical estimation criteria that give us a very robust reserves program so that when missions do have development issues—and they will because, of course, we are doing things for the first time—we are doing things that are state-of-the-art in terms of the science and sometimes the engineering as well. We want to make sure that we have healthy reserves budgeted from the beginning.

Mr. MOLLOHAN. You do not have now?

Dr. STERN. No. We do.

SCIENCE PROGRAM RESERVES

Mr. MOLLOHAN. What reserves do you have typically in these science programs?

Dr. STERN. What we have typically done is asked the mission to propose its reserve level and we evaluate whether we think that is sufficient. Under Dr. Griffin's leadership, we have gone to a different approach in which we use a confidence curve, and we require the missions to be at the 70 percent level in cost confidence, which has empirically been shown to, on average, to be sufficient based on actual aerospace experience. The third component of our cost control is to make sure that we have in our pocket, and are willing to execute, appropriate descopes between full mission success and minimum mission success, what are called level one requirements. We have been taking advantage of that and using it successfully over the last year. I would be happy to provide examples.

Mr. MOLLOHAN. Have you been using it long enough to be able to make comparisons about what the results are and compare the success to the program?

Dr. STERN. Well, I do not think that is ready for a strict mathematical comparison, but we have definitive examples where we were actually able to make relatively minor changes in those requirements allowing us to stay on track with the mission.

Mr. MOLLOHAN. Can you give us an example?

Dr. STERN. Yes, sir. The Kepler mission is a good example. Last summer, they had a fairly significant problem with costs. We worked through their test program and their scientific requirements. We reduced their expected time on orbit by about ten percent and achieved a substantial reduction in their cost needs. By looking at their test program and some other aspects of the mission, we were able to essentially erase what would have been a $50 million class up problem.

Mr. MOLLOHAN. A cost overrun?

Dr. STERN. Yes, sir.

Mr. MOLLOHAN. What kind of problem did you say that was? What problem? Class problem or what?

Dr. STERN. Fifty million dollar class up problem, something——

Mr. MOLLOHAN. Oh, class up. I see. Scale the problem?

Dr. STERN. Scale the problem.

Mr. MOLLOHAN. What was the explanation for the overrun? Just badly estimated to begin with?

Dr. STERN. Well, the Kepler Project has had a variety of difficulties, some on the management side and some in terms of an underestimation of the technical difficulty. When you go out and buy a good digital camera, it has got eight million pixels in the CCD. This is a focal plane which will be the largest CCD focal plane that NASA has ever launched by a very large margin, approaching a billion pixels. The data handling and electronics that go with that turned out to be more complicated tasks than had been understood at the time that the proposal was initially accepted. That and some other technical problems as well as awkward management structure caused that mission to repeatedly get into cost difficulties. However, I have to tell you after the management changes and the suite of direction that we gave them, including this descope, they have been performing extremely well. They are on track and have been month after month for the February 2009 launch date next year. All the performance data we are seeing from the scientific instrument and spacecraft look very good. The team is performing extremely well.

Mr. MOLLOHAN. All that was a contractor issue, not a requirements issue?

Dr. STERN. It involved contractors, as well as, NASA personnel.

SCIENCE MISSION BUDGET

Mr. MOLLOHAN. The 2009 budget request for the Science Mission Directorate reduces the budget for technology missions such as New Millennium and reduces the programmatic content for planetary sciences, technology development from current levels through fiscal year 2012.

What are the implications of the proposed cuts on NASA's ability to pursue several new missions and to maintain schedule and cost discipline in executing them?

Dr. STERN. What we have done is change our approach with regard to how we handle technology budgets. In recent years, much of the technology program has been pooled in a program called New Millennium, which was not for science missions, but entirely for on-orbit technology demonstrations. When we analyzed the effectiveness of that program, we found that it was not as effective as we would have liked it to be. Many technologies that were demonstrated were not needed by future missions and were, therefore, not picked up and had a relatively low efficiency of application. So we have gone to a different approach in which missions individually develop their own technology so that we know that there is a buyer out there that really needs what we are developing. A good example is the James Webb Space Telescope. We could give you other examples. Be happy to do that. In addition, you will see in our budget request we have also augmented the Suborbital Program, which is a natural test bed for technology development. It has been used very successfully in the past. So what we have actually done is redistribute and refocus the way that we spend our technology money, walking away from the older paradigm under a New Millennium to a newer paradigm in which the projects in the Suborbital Program spend technology dollars that we hope will be much more effective use of those funds.

NEW MILLENNIUM APPROACH

Mr. MOLLOHAN. Why? Talk a little more about that millennium approach and the way you are doing it now.

Dr. STERN. Well, as you might imagine, if there is a pool of funds available for technology development, the selection criteria by which that program makes its decisions on what to fly has to be based upon projections of future needs and wants of the Science Mission Directorate. Sometimes those are not the best decisions. At least, historically speaking, we have learned that quite a number of those technologies that were demonstrated on orbit were not, in fact, subsequently used.

Mr. MOLLOHAN. Not used for what?

Dr. STERN. Not used in subsequent science missions. The technology was developed, but it was not technology that people needed to have to do future missions. So by asking the missions to develop their own technology, we know that there is a buyer who really needs it. We are not spending money where we do not need to nor are we buying too much. We know it is going to be applied because it is within the mission's budget and they need to develop it to meet their own needs.

Mr. MOLLOHAN. The next phase?

Dr. STERN. Well, once we develop it to the technical readiness level, where it has been demonstrated on-orbit or on a group test program, if that is sufficient, then the mission that needs it actually flies it and counts on it.

Mr. MOLLOHAN. A lot of cost overruns in NASA's science missions. They have become almost routine. Can you explain why two-thirds of the programs have exceeded their thresholds on costs and schedule?

Dr. STERN. Yes, sir. There are quite a number of factors that are involved in that. We analyzed it and there is no single reason. Sometimes, as Dr. Griffin described yesterday, we have got into management issues like with the Glory instrument. The instrument's supplier was unable to perform efficiently. They moved their operations to another base of operations for development of the instrument and it set it back.

In many other cases, the missions were——

Mr. MOLLOHAN. So Glory was a contractor performance issue essentially?

Dr. STERN. Yes, sir. Other factors have included too ambitious a set of mission objectives for the available budget and not budgeting sufficient reserves. Those are just the things I spoke about earlier that we are trying to rectify now so that we do not have these problems going forward.

COST OVERRUN IMPACTS

Mr. MOLLOHAN. What impact do these overruns have on other projects within the Science Mission Directorate?

Dr. STERN. Well, their effect is particularly what I call "the slaughter of the innocent." When we have a problem that is related to a mission that is in development and we want to go forward and finish that mission, we have to put off future missions. That means delaying or canceling missions that have not gotten into trouble but are in the wings waiting to be started.

Mr. MOLLOHAN. What are some examples of missions that have been delayed?

Dr. STERN. Well, Solar Probe is a good example. Some are the missions that we are starting this year, the Explorer Program within Discovery, there is quite a long list. Almost any mission that we are starting now might have been started earlier, had we not had cost overruns or associated unexpected costs causing us to put them off until we could fit it into the budget wedge of a given year's request.

Mr. MOLLOHAN. How many of the programs that have been eliminated have been eliminated as a result of cost overruns?

Dr. STERN. I would have to take that for the record and have that tallied for you, sir.

[The information follows:]

COST OVERRUNS

No Science programs have been eliminated as a result of cost overruns.

Mr. MOLLOHAN. Some of them have been eliminated because of the budget, right, due to the amounts you are getting overall, but some of them have been eliminated——

Dr. GRIFFIN. It is not a typical event at NASA to eliminate a given mission because another mission had a cost overrun. But delay is common which, of course, produces a cascading effect because the delayed mission then becomes less efficient and may itself overrun and the effect ricochets downstream. I mean, there has been a lot of discussion in this hearing on cost control. We have taken that on as a challenge that we want to address. We are very serious about it because if we can control it better, it feeds on itself. It produces a virtuous circle rather than a vicious circle, where one mission reflects on another downstream and it continues on. If we can get a handle around it, all of our missions will be better off.

RETURNING TO THE MOON

Mr. MOLLOHAN. Dr. Griffin, what is the justification for going to the Moon? Science, preparation to go to Mars, commerce? I read a speech by Dr. Marburger last year where he or a large part of it was justifying going to the Moon for commercial purposes.

Dr. GRIFFIN. Well, I personally think that the justification for returning U.S. astronauts to the Moon is to expand upon their presence. Certainly there is science about the Moon, science which can be done from the Moon, which is of the first rank. You might or might not choose as a policymaker to make that the primary justification, but it is one of the justifications.

Another important justification is if we do believe that Mars is an important destination for humankind, and I do, then we need to go to the Moon before we go to Mars. We are going to be living on Mars for months at a time, many months at a time, and it will take months to get there. We need a lot more experience of living, working, and operating in space than we have today if we are, in my judgment, going to mount a successful expedition to Mars a couple of decades from now. That experience will be gained on the Space Station, and it will be gained on the Moon. When we make mistakes, as we will, it is better if those mistakes occur three days away from home than many months away from home. So it is a training ground for Mars in my opinion.

Finally, Dr. Marburger's speech is one that I remember with great clarity. I thought it was one of the better speeches I have heard on the purposes of space exploration generally. Dr. Marburger asked the question. The question comes down to, do we wish to incorporate space within mankind's economic sphere of influence, or do we not. It is a choice. And I think that the choice should be answered in the affirmative.

Mr. MOLLOHAN. That is a question to be answered to the whole world at this point.

Dr. GRIFFIN. It is, but I would like the United States to be, and to continue to be, a leader in the world and in the world of tomorrow. In my opinion, and very firmly and often stated, if we are unprepared to lead in space, we will not be leaders on Earth.

LUNAR RETURN PROGRAM

Mr. MOLLOHAN. And it is another question to what extent are we prepared to provide leadership with regard to how resources are exploited from the Moon. I mean, as I understood it, he was actually talking about extraction and how you——

Dr. GRIFFIN. That is correct, sir.

Mr. MOLLOHAN. Are we thinking about that as a Nation?

Dr. GRIFFIN. One of our earliest goals with our lunar return program is to learn how to utilize the resources on the Moon and later, on other planets, to again reduce the dependency on supplies shipped up from Earth. In a word, without using money, we are looking at how one goes about creating an economic enterprise in space, how one utilizes the resources and capabilities that are there in furtherance of human activities.

Mr. MOLLOHAN. A lot of aspects to that?

Dr. GRIFFIN. There really are.

Mr. MOLLOHAN. Much more than to get into here.

Dr. GRIFFIN. It is fascinating. It is important. And it is about our future.

Mr. MOLLOHAN. Yeah.

Mr. Culberson.

NASA FUNDING LEVELS

Mr. CULBERSON. Thank you, Mr. Chairman.

It is always a joy to have you guys here and to work with you, with NASA, with the scientific community.

My hero, Thomas Jefferson, always said that you enjoy the dreams of the future better than memories of the past and it is one of the great aspects of this job, that we get to help you make the dreams of the future come true.

And it is particularly frustrating to see the Office of Management and Budget continue to give recommendations to this Committee and the Congress that inadequately fund NASA. You have got more on your plate than you can deal with.

One of the things I would love to work with you on, Mr. Chairman, Mr. Frelinghuysen, Mr. Schiff, and others on this Committee and the other authorizing Committee is I would love to think longer term about restructuring the way you all are managed.

I think you have got a lot of funding problems because you are subject to the whims of the Office of Management and Budget.

And I would love to see the recommendations for NASA's budget come from an independent panel of engineers and scientists that are not obligated politically to any Administration or any political party but are driven purely by science and engineering. Anyway, just something to think about for the future because it is just going to continue to be a problem.

And I know that the Chairman mentioned earlier during the earlier set of hearings and of questioning.

I know how frustrating it is to you and would love to sit down with you and talk to you in some detail about what we ought to do for the future to cure some of those problems.

But let me zero in on a couple of areas in particular that are of concern. And I am struck in particular by the phrase "put off the future and slaughter the innocent." I just grieve. We all do.

In particular, the most successful, I think, missions that NASA has ever flown, the Mars exploration program, the highest number of hits ever on NASA's web site were immediately after the Mars Rovers landed and they are, of course, still operating, doing beautifully. You have got a terrific team of scientists working on that, on the Mars missions.

I think without a doubt that is one of the most successful programs at NASA. Yet, you are asking for a big cut. You are taking money away from—you mentioned yesterday, Administrator Griffin, Mars has been so successful that you are taking money away from it to fund other flagship missions.

And I know you have got a lot on your plate. But it just frankly to my mind, and I know to Mr. Schiff and others on the Subcommittee, is unacceptable to take money away from Mars when they have been so successful.

Could you comment on the funding levels that you are asking for this year that OMB, excuse me, Office of Management and Budget, not you guys—you made your best case to OMB and the bean counters over there are recommending this big cut, bean counters and bureaucrats, which drive me nuts. I think it is one of the problems.

If we would let the scientists drive NASA and then the engineers who we have so much faith in it rather than the bureaucrats. But if the OMB recommendation were followed, it appears to be, and

I have got this from a variety of very knowledgeable sources, if we followed the recommendation of OMB in order to keep a Mars sample return mission in 2020, would it not be essentially impossible to do any Mars missions between the Mars science lab which has, I know, had a little bit of a delay, I understand you may have to change the heat shield because of some tests that showed that the existing one may not be adequate and that that may delay it and knowing that you can only launch to Mars I think every other year because you have got to wait until it is essentially on its closest approach to Earth, so if we follow this recommendation in light of those restrictions, would it not be essentially impossible to do any Mars missions between science lab and sample return?

Dr. GRIFFIN. I will let Dr. Stern speak to that. But, no. We do have Mars missions between MSL and Sample Return.

Alan.

Dr. STERN. Yes, sir. We are going to be flying next the aeronomy mission of which I spoke to you just a little bit earlier, a highly recommended mission to study the mission of Mars' atmosphere, how it lost its oceans, et cetera.

Mr. CULBERSON. Now, these are low to moderate cost missions?

Dr. STERN. This is a medium-scale mission.

Mr. CULBERSON. Medium scale.

Dr. STERN. In costs, it is very similar to many of the orbiters that we now have operating at Mars, in fact.

Mr. CULBERSON. Could you tell me its name again, sir. I am sorry, Dr. Stern.

Dr. STERN. Mars Aeronomy. Aeronomy is the study of upper atmospheres.

Mr. CULBERSON. Aeronomy.

Dr. STERN. Aeronomy, A-E-R-O-N-O-M-Y.

Mr. CULBERSON. Okay. That is actually a word I am not familiar with.

Dr. STERN. It is a term invented in the 1950s, the study of the upper atmosphere of the Earth.

Mr. CULBERSON. Okay. So that is a medium. But if you, therefore, are going to do a series of low to moderate cost missions, do you not have to postpone—this, I understand, is a conclusion of a group of Mars scientists who looked at this and concluded that if you do these moderate to low cost missions in 2013 and 2016, you have to postpone the sample return indefinitely?

Dr. STERN. No, sir, I do not believe that is the case.

Mr. CULBERSON. That is not accurate?

Dr. STERN. That is right. Our analysis, we——

Mr. CULBERSON. Top scientists working on——

Dr. STERN. The analysis that we have shows that we can support the Mars aeronomy mission——

Mr. CULBERSON. Okay.

Dr. STERN [continuing]. Which itself is approximately a half a billion dollar enterprise, an $880 million mission for 2016. The Mars community is deciding what they want to do. That is a fairly large mission as Mars missions go. That is the next launch opportunity after aerology. In that same timeframe, we are supporting U.S. participation in ESA's, European Space Agency, rover activity, where we are putting about $70 million worth of instruments on their rover mission. Then it is our ambition to have the first of the Mars Sample Return missions, and they have to be staged a few launches in a row. The first would launch in 2018 to begin the Mars Sample Return enterprise. We are still looking at the architecture for that. We may put the orbiter there first, which would be the rendezvous return vehicle bringing the sample back, and provide communications architecture, or we may provide the rover first. And that study is still in process.

Mr. CULBERSON. Okay. So you are happy with OMB's recommendation on Mars and you would not ask for any more?

Dr. GRIFFIN. Let me, if I might, make a comment, Mr. Culberson. There has been considerable discussion of the cuts and reductions we have proposed in the Mars program already. That is a matter of policy. One can spend more on Mars, but then one must spend less on Earth Science which we have recommended increasing.

Mr. CULBERSON. Unless we give you more money overall.

Dr. GRIFFIN. Well, of course. But that is not what the Administration is recommending. One must spend less on an outer planets mission. The question is not whether good work can be done on Mars. Of course it can. It is a wonderful program. It has gotten an A grade. It is a wonderful program.

Mr. CULBERSON. Why would you cut it then?

Dr. GRIFFIN. Because there are other programs and other communities of outer planet scientists. There are other communities of scientists besides those working on the Mars program. The question is, what is an equitable and reasonable balance of resource distribution across our many communities.

Mr. CULBERSON. Okay.

Dr. GRIFFIN. Mars is not the only scientific community that NASA supports.

Mr. CULBERSON. Okay.

Dr. GRIFFIN. And I have to say that without offering——

Mr. CULBERSON. Part of our job on this Subcommittee is to help make those policy decisions and we will help you.

Dr. GRIFFIN. Yes, sir. I have to say that without any criticism of the Mars community which has done a wonderful job.

Mr. CULBERSON. Right.

Dr. GRIFFIN. But our planetary science program cannot be all Mars all the time.

Mr. CULBERSON. Well, I am not suggesting. And we know you do not have enough money on your plate. This Subcommittee is——

Dr. GRIFFIN. I cannot do an outer planet flagship unless I take money from some other pieces of the Planetary Sciences Division.

Dr. STERN. Sir, if I may interject just to tell you a little bit of history. This is not new. Now, I have only been at NASA a year, but I have been in the Planetary Science Program for decades. For example, in the 1990s, we can only afford in that program, as we do in others, one flagship at a time. Those are very expensive enterprises.

Mr. CULBERSON. Right. The Cassini class.

Dr. STERN. Cassini was a flagship of the 1990s.

Mr. CULBERSON. Right.

Dr. STERN. Following that, we did Mars Science Lab.

Mr. CULBERSON. Okay.

Dr. STERN. Now, and according to the decadal survey, in fact, it has turned——

Mr. CULBERSON. Outer planet——

Dr. STERN. It is time to catch up on Europa or the outer planet flagship and then we go to the Mars——

Mr. CULBERSON. Science, but I love it.

Dr. STERN [continuing]. Sample Return, which is the following flagship to that. So we take turns and we are following the behavior that has been——

Mr. CULBERSON. Okay.

Dr. STERN [continuing]. In place for quite a while.

OUTER PLANETS MISSION

Mr. CULBERSON. Talk to me for a minute about the flagship to Europa, the outer planets mission, which is the highest priority of the decadal survey, and how you intend to get there and what time frame to Europa——

Dr. STERN. Yes, sir.

Mr. CULBERSON [continuing]. Which is the moon of Jupiter that has an ocean, saltwater ocean that is as large or maybe even larger than, in terms of volume, the oceans on the Earth.

And because of tidal flexing, of course, you have got heat coming up from the bottom of the ocean and almost certainly vents, volcanic vents where you have got heat and saltwater very likely the chemical energy then producing life like we have on the bottom of the mid ocean ridges on earth which is why, of course, we do not want to go there, right?

Dr. STERN. Yes, sir. You are going a little further than I would as a scientist.

Mr. CULBERSON. Logical, though.

Dr. STERN. We are genuinely conservative in our extrapolations, but we do know that Europa has an ocean on its inside. In fact, one of the great discoveries of the outer planets program, which the United States has led for the world, is that oceans are very common. It is just that they are rare on the outside of planets. They are very common on the inside of these icy worlds like Europa. The question, the operable question about Europa is how deep is the ice until you get down to the ocean. Is it accessible that we could actually imagine some 21st century probe getting through that ice? If it is hundreds of meters or perhaps a kilometer under the surface, one can imagine down the road, towards the middle of this century having the technology to get a probe into that ocean, which can communicate back to us.

Mr. CULBERSON. And get off and swim in the ocean.

Dr. STERN. Like a submersible, for example. But if it is many kilometers, that will not be possible. So the purpose of the Europa mission, if that is the outer planet flagship that we fly, is to assess the depth of the ice down to the ocean interface. Now, I am not sure if you are aware, but the science community has put forward three different concepts for an outer planet flagship, which are in competition, Europa being one of the three. Our Cassini mission, which is at Saturn, the Cassini Saturn orbiter, is a flagship mission itself.

Mr. CULBERSON. It is still thriving and doing well?

Dr. STERN. It is doing extremely well. We have just authorized it for an extended mission. It has discovered another kind of ocean, actually lakes.

Mr. CULBERSON. Encelioides?

Dr. STERN. This is a Titan, a world that is larger than some planets in our solar system. These are hydrocarbon oceans. It is estimated that Titan has more than a hundred, and perhaps more than a thousand times the hydrocarbon reserves of the Earth. This shows an analogy to the early Earth's environment, a pre-biotic environment of extremely high interest to the planetary science community.

Mr. CULBERSON. Maybe a good gas station on the way there.

Dr. STERN. It could turn out to be that way in the future, yes, sir. There is a third competing outer planet mission.

Mr. CULBERSON. Okay.

Dr. STERN. Those are going through scientific development and peer review.

Mr. CULBERSON. Titan, Europa, and what is the third one?

Dr. STERN. The third one is called the Jupiter science orbiter, which would be a second-generation Galileo mission and would terminate in orbit around another one of Jupiter's planet-size moons, Ganymede, which also is believed to have an ocean like Europa on its interior, but it is easier to access because the radiation environment is lower at Ganymede.

Mr. CULBERSON. That is the third Galileo moon?

Dr. STERN. Yes, sir. It is, yes.

Mr. CULBERSON. I was not aware it had an ocean.

Dr. STERN. Yes, sir.

PROMETHEUS MISSION

Mr. CULBERSON. Okay. But all the work, of course, that has been done, you are going through a competition now. But I always remember my first year on this Subcommittee, I asked for a variety of briefings and was absolutely charmed and mesmerized with the Prometheus mission that John Casani, and I hope he is still thriving and doing well, you are taking good care of the projects.

Dr. STERN. Yes.

Mr. CULBERSON. John Casani is a national treasure.

Dr. STERN. Yes, sir.

Mr. CULBERSON. He is at JPL and doing well, I hope.

Dr. STERN. John is fine.

Mr. CULBERSON. Yeah. He was leading that effort and they briefed me on these different missions they had. And this one they were developing. They were going to Europa and they were developing an ion engine because today we are still flying the same rocket engines that Robert Goddard designed.

It is fundamentally, but they were better pumps obviously and better fuel, but fundamentally we are still flying Robert Goddard 1920 technology. It is like we have left our astronauts and the science community at NASA, it is like leaving our Navy shoveling coal in the steam-fired boilers. It just drives me nuts. I want to help you find a way to develop that next generation of rocket propulsion.

But on the outer planets mission, what timeframe are you thinking about? And I am concerned that we are just not going to get it flown because it is a Cassini-class mission. It is a big——

Dr. GRIFFIN. We are talking 2016 or 2017 for the outer planets flagship, whichever——

Mr. CULBERSON. For launch?

Dr. STERN. Yes, sir. The President's budget request provides a sufficient budget wedge to launch that mission by 2016 if it is Jupiter and 2017 if Saturn is the target. That is driven by the orbital mechanics, not by our budget needs. That also times well with our European partners, who will be major partners, as they have in other flagships——

Mr. CULBERSON. Okay.

Dr. STERN [continuing]. The outer planets. How their funding profile——

Mr. CULBERSON. And that would include a lander obviously for Europa; would it not?

Dr. STERN. No, sir, not for Europa. It is only an orbiter. The Titan concept does include a lander. These are very different missions obviously and the Jupiter science orbiter is yet a third architecture——

Mr. CULBERSON. Okay.

Dr. STERN [continuing]. Depending upon the needs. But we are——

Mr. CULBERSON. Okay. So you are saying 2016 or 2017 for launch?

Dr. STERN. Yes, sir.

Mr. CULBERSON. And you are sure we can get there with the money that you are asking for on the glide path that you are on?

Dr. STERN. I am quite confident of it because we are scoping the mission to fit the budget, not leaving it open-ended in budget to fit whatever desires might be out there.

Mr. CULBERSON. Okay. The Chairman has been very generous of the time. Whenever you need me to stop. I could just go. But, I mean, I would love to ask about SIM, for example. Can I have a couple more minutes, two more minutes, a minute?

Mr. MOLLOHAN. Why don't we come back to you——

Mr. CULBERSON. Sure. Yes, sir.

Mr. MOLLOHAN [continuing]. Because you have had ample——

Mr. CULBERSON. I know Adam will also have——

Mr. MOLLOHAN. Mr. Schiff.

OUTER PLANETS MISSION

Mr. SCHIFF. I was going to say, Mr. Chairman, I would be happy to defer a couple of my minutes to Mr. Culberson because I actually just wanted to comment on something that Mr. Culberson said and then I would be happy to yield to the gentleman.

I strongly support the outer planets mission. I think it is some of the most interesting work that NASA does and I am very excited about all the possibilities. And I have loved reading about the hydrocarbon lakes on Titan which are wonderful to imagine. My own theory is that there were dinosaurs up there.

But I do not think the situation is that we cannot do outer planets if we want a strong Mars program. We cannot do our sciences if we want to do SIM. We cannot do SIM if we want to get the cost overruns under—of the Webb telescope under control.

The testimony you cannot give, I will give. If you were not constrained to be soldiers in the service of the Administration, you might come in and say we have to make drastic cuts to Mars and it is criminal because Mars is the best, one of the best programs that we have run. But we are going to cut it in half over the next five years because this is what we have been given.

You might say if you were not constrained by the Administration that we have historically underfunded Earth sciences. There is a lot of need to do work in our sciences. We need to understand global climate change better. We need to make investment there. But we are not going to come in to you and ask you to savage Mars to do Earth sciences.

We want to go with outer planets. We have got three great candidates. We would love to do two of them or three of them, but that is not possible. But we are committed to doing one of them and we are going to find out which is the best.

You cannot say that, but it is our, I think, responsibility to look at those sacrifices you are proposing to be made in the interest of the numbers you are getting from OMB and the Administration. But I do not think it is productive to try, either try deliberately or have the inadvertent effect of trying to pit one center against another or one project against another.

This is not, you know, whether we do outer planets or we do Mars or whether we do Webb or whether we do whatnot and I do not think it is constructive to the process to suggest that it is. Exactly. Exactly

And I would be happy, Mr. Chairman, to yield the balance of——

Mr. CULBERSON. No. I am through. I had a chance to ask my question, so I would yield to my colleague.

Mr. MOLLOHAN. Thank you.

Dr. GRIFFIN. May I comment, sir, or would you prefer that I did not?

Mr. MOLLOHAN. Certainly.

Dr. GRIFFIN. We are not trying to pit one program against another or one Center against another. That is the last thing I want to do. I have striven hard for three years for more unity in support of all within our program. But it is fiscally true that at whatever budget level you would care to set, this Administration has set a budget level, which is very favorable to NASA in comparison with other domestic discretionary programs. But at whatever budget level you would set, you would have competition from various communities, each wanting to have the lion's share of that budget. We try very hard without putting our own spin on it to execute what the scientific community says are its priorities in each of these different camps.

But they are irretrievably committed to scientific competition for scarce resources among themselves, and we try to sort that out on an objective an impartial basis. We are not trying to create rivalries of one Center against another or one program against another.

Mr. SCHIFF. Happy to yield.

Mr. CULBERSON. Mr. Chairman, may I follow-up? Thank you.

I think one way that this Committee can certainly deal with it, it seems to me and our colleagues on the authorizing Committee, is to do whatever we can and we need to do to make sure that NASA flies the decadal survey missions as you always have. That is a great way to prioritize.

The scientific community, as you know, has this survey every ten years. They meet. They talk. They debate. And they voted scientists one of the highest priorities. And you all have always flown those missions and that is, of course, what outer planet mission is, but the scientific community chose Europa.

Why are you going back through another competition when the scientific community has said Europa is the highest priority?

We have got this magnificent mission at Titan. We have landed on Titan. Cassini is doing beautifully, will obviously continue to thrive for years.

Why are we doing another competition when the decadal survey says it is Europa?

Dr. GRIFFIN. Between the time when the last decadal survey said to go with preference to Europa, we have flown the Cassini mission and learned much more from earlier missions. So now the scientific community is no longer sure that they want to go to Europa as a first preference. They may, but these other possibilities have been put on the plate. I will emphasize again we, NASA, as a Federal agency are not trying to dictate to the scientific community which priority it must have.

Mr. CULBERSON. Okay.

Dr. GRIFFIN. We are also not trying to tell them that once you pick Europa as a priority, it must forever remain your priority. We are giving them the latitude before we actually start spending money on a particular path.

Mr. CULBERSON. On a flagship mission.

Dr. GRIFFIN. Flagship mission. We are giving them the latitude to change their minds.

OUTER PLANET FLAGSHIP PROCESS

Mr. CULBERSON. Okay. How do you do those surveys, if I could, Dr. Griffin? What is the process? How do you do that? Who will make the decisions? I hope it is essentially a peer review. You know, the scientists and engineers and not being driven by a political appointee or a bureaucrat somewhere. That is really the scientific community that will make this decision, which flagship we fly.

Dr. STERN. Yes, sir.

Mr. CULBERSON. What is the process?

Dr. STERN. Let me——

Mr. CULBERSON. How do we guarantee that——

Dr. STERN. You are specifically asking, I believe, about how we are going to choose the outer planet flagship.

Mr. CULBERSON. Between these three, yes.

Dr. STERN. Yes, sir.

Mr. CULBERSON. What is the procedure?

Dr. STERN. We are actually in the middle of that process. As Dr. Griffin described, science is always evolving. Because we flew the Cassini flagship, interest in Titan rose quite a bit, also in

Enceladus as well, the moon of Saturn that has the giant geysers that you are familiar with.

Mr. CULBERSON. Water geysers.

Dr. STERN. Right. As a result, through our Outer Planets Assessment Group, led entirely by scientists, not bureaucrats or politicians——

Mr. CULBERSON. Good.

Dr. STERN [continuing]. They took it through a variety of different possibilities. Their charge from NASA, from the Science Mission Directorate was as follows. Historically and as we see going forward, outer planet flagships have been rare and precious, with approximately one every 15 years. So pick this one carefully based on needs and what can best advance the science field, because the next one will come down the road another 15 to 20 years.

So start with the fact that Europa was the highest priority in the 2001 decadal survey process. But take into account everything we now know so we don't misfire using only data from almost a decade ago.

Mr. CULBERSON. Okay.

Dr. STERN. And then do the scientific rankings at the same time that we are doing engineering studies and costing studies to see what produces the best result to fit in the budget envelope, to deliver the biggest bang for the approximately——

Mr. CULBERSON. Okay.

Dr. STERN [continuing]. $2.1 billion that is available.

Mr. CULBERSON. It sounds good. And I would like to be briefed outside of this hearing. I would like to come down and have you talk to me about when you are doing it, because I would love to help. I want to be a——

Mr. STERN. We would love to do that.

Mr. CULBERSON. We want to participate and help. I don't know that the OMB has ever given you a budget request that has been sufficient. And this Committee—your best friends in the world are right here. These are your best friends in the world.

Dr. GRIFFIN. And we take it that way, sir.

Mr. CULBERSON. It is meant sincerely. We want to help. But it is frustrating.

And I want to be sure, Mr. Chairman, before we—if I get a chance to come back to ask about the near earth asteroids that they were referring to earlier. If I am correct or actually you are supposed to identify ones that could strike the Earth, to identify ones that could at some point impact the Earth and how you would intercept them and nudge them out of the way. And be thinking about that. If I could, I want to do that and follow up. And then also trying to nail them down on SIM, if I get a follow up.

SHUTTLE MANIFEST MISSION

Mr. MOLLOHAN. Oh, you will get a follow up. It is quite an agenda there. I was going to comment that you can tell your best advocates are sitting on this Committee although it needs money.

In light of the Shuttle flight delays that have occurred since the shuttle's return to flight after the *Columbia* accident, how realistic is it to assume that the shuttle will be able to complete all the remaining missions on its manifest by October of 2010, Doctor?

Dr. GRIFFIN. Well, to complete the remaining Shuttle manifest missions means that between February of 2008 this year, counting the mission we just flew and the end of 2010, we need to fly five missions a year on average. Our historical flight rate, including periods of time of almost three years each, where we had two Shuttle accidents and were down, as well as other periods of time where we were down for extended periods without an accident, our historical average is four-and-a-half flights a year. So we are now in a period where we were up and running and operating relatively smoothly. I have every confidence that we can execute at the rate of five flights a year from now until retirement.

Mr. MOLLOHAN. And does that complete the manifest?

Dr. GRIFFIN. And that completes the manifest that has been scoped out.

Mr. MOLLOHAN. How will NASA avoid the schedule pressure that the Columbia Accident Investigation Board warned against when NASA's need to complete the Space Station's assembly, repairing the Hubble Telescope, creeps up against that October 2010 deadline? Did your answer to the last question imply that you are not going to have this schedule pressure?

Dr. GRIFFIN. No, it didn't. We always have schedule pressure. I dislike intensely the idea that external reviewers and advisers suggest that we should ignore schedule pressure. The importance of schedule is obvious to all project managers who ever ran any project in any kind of a human field of endeavor.

Time matters. The expression, "time is money," didn't just originate for no reason. Time matters. What I would like for you to want of us is that we are a group of responsible managers who know how to balance schedule pressures against cost, performance, and risk, and to do so in a manner that no one of those parameters ever gets out of the box. It is true that in the past, in space projects as in many others, sometimes schedule pressures have been allowed to dominate inappropriately and to produce bad behavior and bad outcomes. Whenever a failure happens—a Mishap Investigation Board looks at it, and says that we should not do that. That is correct. We should not. We should not allow schedule pressure to dominate. But at the same time, we cannot ignore it. We must take it into account. We must make operational decisions to fly or not to fly in the face of less information than we would like to have. But we must do it. I think we are doing it today quite well.

Mr. MOLLOHAN. At what juncture will you know that you have time to complete all the missions on your manifest by the scheduled——

Dr. GRIFFIN. This is 2008. At this point in time, we have until end of Fiscal Year 2010 to accomplish the job we want. So all of 2009, all of 2010 and half of 2008, 30 months to accomplish the missions we need. If we get down to the last year, and still have nine missions to go, I would be very concerned. I mean, I would say we probably can't accomplish that. If we get down to the last year and have six missions to go, I would say we probably can.

Mr. MOLLOHAN. Is there a contingency to push the date out if necessary? And what would be the consequences of that?

Dr. GRIFFIN. I would not. Again, you are asking me for an opinion. There is not presently a plan to push the Shuttle missions out beyond 2010. I would not want to do that, because our future mission portfolio, discussed earlier from Members of the Committee, showed how we get into program overruns and delays and all of that. A classic way to get into an overrun situation is to have funding instability in early years. I mean one can make technical mistakes, one can mismanage contractors. Those things can happen. But a classic way is to underfund or to disrupt the funding stream promised to programs.

If we fly the Shuttle beyond 2010, that will take an additional $3 billion or so for every year that we wish to keep the shuttle fleet around. That will produce a huge collateral damage effect on all other programs within NASA. I don't recommend that to you. We will do as the Congress directs, of course. But I don't recommend it to you that we extend the program.

HUBBLE SPACE TELESCOPE

Mr. MOLLOHAN. What is the priority of Hubble in that with——

Dr. GRIFFIN. The Hubble will fly this August or September. And so it is——

Mr. MOLLOHAN. It is in the—well in the——

Dr. GRIFFIN. It is the third flight from now. I mean, we are launching next week. We are launching in May, and then we do Hubble.

Mr. MOLLOHAN. Is next week's flight a night flight?

Dr. GRIFFIN. It is a 2:38 AM launch on March 11th we are currently scheduled, sir. So I don't recommend we extend the Shuttle program past 2010. The other thing is for the Shuttle workforce itself, what our workforce needs is again stability. Stability in our plans. They need to know that we expect them, and we expect to pay them through 2010. And that after that we will transition to new programs, that we will work with them as best possible to transition them over.

But they need to know what is going to happen, not to be deciding every year, will we extend the Shuttle program or not extend the Shuttle program.

Mr. MOLLOHAN. Mr. Frelinghuysen.

BUDGET STABILITY

Mr. FRELINGHUYSEN. This issue of budget stability, obviously, was sort of one of your centerpieces yesterday. What in this given time of Fiscal Year 2009 and 2010 makes the Constellation programs particularly vulnerable?

Dr. GRIFFIN. We are in possibly the most difficult transition period in the 50-year history of NASA. We are trying to phase out——

Mr. FRELINGHUYSEN. Yes.

Dr. GRIFFIN [continuing]. In a disciplined, orderly, rational, intelligent, impartial way. We are trying to phase out a system that will be 30 years old by the time we fly the last flight. We are trying to phase in a new system to accomplish——

Mr. FRELINGHUYSEN. This is a special plane, because time is a wasting.

Dr. GRIFFIN. Yes. Yes, sir. This is a very special time period. We are trying to phase in a new system with a minimum of delay.

Mr. FRELINGHUYSEN. And this would be part. And I don't mean to be rhetorical here. Get back to what some raised yesterday that is you had to leave a portfolio for the next President, that this is part of what you would say in terms of your anxiety or expectations.

Dr. GRIFFIN. Absolutely, sir. Absolutely. On behalf of the Nation's civil space program. We have set a course. I believe it is an intelligent course. It clearly is dependent upon the amount of money we have. But for the amount of money we have, I believe we have an intelligent course of action. That we should stay on it.

Mr. FRELINGHUYSEN. Thank you for letting me get my oar in the water.

SUPPLY MISSIONS

Mr. MOLLOHAN. The last missions on the manifest are supply missions, are they not? And I understand there are provisions that can only be taken up by shuttle?

Dr. GRIFFIN. That is correct, sir.

Mr. MOLLOHAN. Are they at all expendable? And would you push out the last fly date in order to accommodate those missions?

Dr. GRIFFIN. It depends on what you mean by "push out." Now our target is to finish flying by the end of Fiscal Year 2010. But we rarely get, and we do not expect to get, new Fiscal Year monies on October 1st of any given year. So we go into any new fiscal year with a little bit of carryover for several weeks or a couple of months worth of operations.

So no irretrievable harm would be done if our last mission launched in—I will just pick a number, November of 2010 versus September 30th, of 2010. No one would notice the difference in our budget. If we tried to go more than a couple of months and use money from a new fiscal year, we would have to keep contracts open that we intend to close. That would then now get us into a huge impact. Again, I do not want to do that. With regard to the last couple of flights that you asked about, the plan in our manifest is that those are logistics flights. Yes, sir. They carry up spare parts for the Station to allow it to continue operating in the event of breakage of some certain subsystems. They carry up spare parts that we cannot get up by any other means, because——

Mr. MOLLOHAN. That sounds like they are pretty important.

Dr. GRIFFIN. They are very important to us. Precisely because we expect to have a five-year gap where we don't have real good access to the Station, because the Shuttle will be retired. Our new systems will not be available. We need to preposition those spare subsystems and parts ahead of time. Now you asked, "is it a hard cutoff." Well no, first of all, we are not flying up all the spare parts we have. We are leaving some on the ground. That involves a reasoned judgement as to which subsystems and units are most likely to fail. Which are least likely to fail. We make the best judgement we can based on our existing flight experience, but we will leave some things on the ground. Can you leave more on the ground? Sure. We don't want to. We would like to fly it all. It is a question of engineering judgement as to what will fail first and how often it will fail. We are making those judgements at a time when we don't really have enough flight history on the Space Station to make the best judgement we could make. So we are making reasoned judgements. They are not perfect. We hope to get as many spare parts as possible up before we end the Shuttle Program.

COMMERCIAL ORBITAL TRANSPORTATION SERVICES (COTS)

Mr. MOLLOHAN. Can any of those spare parts—when will the unmanned alternative systems be available? Will they be available before the 2015 date, the COTS Program?

Dr. GRIFFIN. I can comment on COTS. We have a procurement going out this year. So I would like Mr. Gerstenmaier to comment on the details of the commercial procurement that we are trying for——

Mr. MOLLOHAN. Okay.

Dr. GRIFFIN [continuing]. Unmanned cargo, to answer your question.

Mr. GERSTENMAIER. We just released a draft request for proposal for the resupply services. That went out last week. In that we specify how much cargo we need, roughly, by calendar year. The cargo is in three categories. It is unpressurized cargo, cargo that can fly outside exposed to the vacuous space, cargo that flies on the inside or pressurized cargo, and then there is a line for cargo we would like to return to the ground. That cargo is broken out by metric ton delivered in each of those calendar years. We show we can start taking cargo as early as 2010 from a commercial supplier if we get a proposal back that shows that they can provide that capability to us. It starts at a very modest amount in 2010, roughly on the order of a metric ton or so. It grows to about 10 metric tons per year beyond that period. That is what we are seeking from the commercial sector to see what is available.

Mr. MOLLOHAN. Are there items that you are talking about in these last Shuttle flights that could not fly commercially?

Mr. GERSTENMAIER. We selected items for these last Shuttle flights that are uniquely suited to the Shuttle. For example, the large control gyros that provide stability for our Space Station.

Mr. MOLLOHAN. Okay.

Mr. GERSTENMAIER. There will be two of those on those flights. They could fly on an expendable vehicle. But they are going to really stretch the capability of the expendable vehicle. They may drive the shroud larger. They may drive up mass requirements. We picked items for the Shuttle flights that the Shuttle is uniquely suited to carry. Those last spares are uniquely designed for Shuttle. Also, the design environment, how much it will get vibrated during assent, thermal environment, if they need power, those kinds of considerations. If they are uniquely suited to Shuttle, we have chosen those to be placed on the Shuttle flight.

Mr. MOLLOHAN. Not that you could do them otherwise, but——

Mr. GERSTENMAIER. But there will be an additional cost and——

Mr. MOLLOHAN. Time and money.

Mr. GERSTENMAIER. It will be an additional expense and drive a unique capability to the expendable that has not flown on a routine or easy basis.

Mr. MOLLOHAN. Do you have authority, Dr. Griffin, to extend the sunset date for Shuttle missions?

Dr. GRIFFIN. I do not. No, sir.

Mr. MOLLOHAN. You do not?

Dr. GRIFFIN. I do not.

Mr. MOLLOHAN. Where does that reside?

Dr. GRIFFIN. Well, Presidential policy was established before—actually before my arrival at the agency. Recommending a 2010 retirement date. The 2005 Authorization Act for NASA stipulated a retirement date of 2010, I believe.

Mr. MOLLOHAN. So it would require a new Congressional authorization——

Dr. GRIFFIN. I——

Mr. MOLLOHAN [continuing]. To extend?

Dr. GRIFFIN. I am not an attorney. I am an engineer. I—my understanding of——

Mr. MOLLOHAN. No. I——

Dr. GRIFFIN. My authorization is that if one wished to extend Shuttle flights beyond the year 2010, it would require Congressional authorization. That is my understanding, sir.

Mr. MOLLOHAN. Mm-hmm. Mr. Frelinghuysen.

ARES THRUST OSCILLATION

Mr. FRELINGHUYSEN. Getting back to the stability in your budget issue, I don't want to have a play on words. But the road to an initial operational capability in March of 2015 depends on stable funding.

Dr. GRIFFIN. That is correct.

Mr. FRELINGHUYSEN. Absolutely essential.

Dr. GRIFFIN. That is correct, sir.

Mr. FRELINGHUYSEN. But the road is not without some impediments. I don't mean to raise the specter of GAO. But GAO has highlighted several critical risk factors in constellation program, which I am sure you are quite familiar with.

Could you comment on thrust oscillation? Where we stand. Is that one of those obstacles?

Dr. GRIFFIN. It is one of the obstacles GAO quotes.

Mr. FRELINGHUYSEN. Well, how do you view it? If I set these up, will you bat them out of the park?

Dr. GRIFFIN. Probably. I am happy to tell you more about thrust oscillation——

Mr. FRELINGHUYSEN. Yes, would you.

Dr. GRIFFIN. More than you would ever want to know.

Mr. FRELINGHUYSEN. How are you dealing with it, and defining requirements, and impact of the weight of vehicles. Those sort of issues that the GAO raised.

Dr. GRIFFIN. The issue of thrust oscillation and solid rocket motors is nearly universal. When we began the detailed design of the Ares rocket, which uses the solid rocket motor first stage, we realized it was likely to have, in the worst case, considerably more effect than we see on our Shuttle flights, where we have a huge stack of hardware that essentially damps out the vibration. That may very well end up being the case on the Ares. But in case it is not, we have had a Tiger Team looking at that for the past four months. First of all, we have carefully refined our estimates of those loads down to a factor of five or more, lower than originally thought.

So the loads themselves are not as great concern as originally thought. Second, we have come up with several mitigation methods. In fact, the team that has been working this meets next week to provide a set of final recommendations for flight on how we will design the thing to deal with those loads. I had a review of that just yesterday, a quick review of progress. I am entirely satisfied with what they are doing. I don't see that as an insurmountable obstacle to our flying.

Mr. FRELINGHUYSEN. Relative to defining requirements and the impact on the weight of the vehicles.

Dr. GRIFFIN. We will have the estimate for that next week.

ORION HEAT SHIELD

Mr. FRELINGHUYSEN. Technology development such as the Orion heat shield.

Dr. GRIFFIN. The Orion heat shield is an interesting matter. Mr. Culberson mentioned the Mars Science Lab heat shield. It has been a while in this country since we have flown heat shields that were significantly challenging beyond the Shuttle materials. So we are having to reconstitute the Nation's technical base for those types of heat shields. It does not rise to the category of a problem for Orion. It is not a schedule driver. It is not a cost driver. It is not a technical driver. But it is a fair statement to say that the Nation, as we sit here today, cannot replicate the heat shield used for the Apollo spacecraft.

Mr. FRELINGHUYSEN. Yes.

Dr. GRIFFIN. We drifted away from that technology when we adopted Shuttle. There was no other market for it, so we have to recreate it. But I am not worried about that.

WIND TUNNEL TESTING

Mr. FRELINGHUYSEN. Their contention that test facilities are inadequate to demonstrate new technologies.

Dr. GRIFFIN. I do not think that is right. We are testing those technologies today out of the Ames Research Center in our jet that we have out there. We do other tests in wind tunnels.

Now, we do need to again reconstitute a technical base that was allowed to drift away, that once existed in the Nation when it was allowed to drift away.

Mr. FRELINGHUYSEN. It drifted or atrophied?

Dr. GRIFFIN. It atrophied. But between the Aeronautics Research Mission Directorate and the Exploration Systems Mission Directorate, we are aware of that. We know what we need to do and it is in the budget.

Mr. FRELINGHUYSEN. And that is reflected, of course, in the confidence factor which you have repeated again. And we will not have you mention the percentage.

Dr. GRIFFIN. Absolutely. I am not trying to convey the impression to the GAO or anyone else that we do not have technical problems to solve. We do. You, this Congress, appropriate money for us to do bold new things that involve the overcoming of technical problems. You pay us to do that. We are doing it. It is frustrating sometimes and I think ultimately counterproductive for people to say, well, you have technical problems to solve as if that were new news.

Mr. FRELINGHUYSEN. You do it every day?

Dr. GRIFFIN. We do it every day.

Mr. FRELINGHUYSEN. Everything you do is inherently risky?

Dr. GRIFFIN. It is what you pay us to do.

Mr. FRELINGHUYSEN. That divisible report, I just wanted to give you an opportunity to, shall we say, set the record straight.

I do not have any problem with your reassurance, but sometimes the public record needs to reflect your strong objectives to some of the conclusions they have reached.

Dr. GRIFFIN. Do not mind providing you with that opportunity.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Dr. GRIFFIN. If we did not have technical problems to solve, I would not be interested in this job.

Mr. FRELINGHUYSEN. I am sure. Thank you.

Mr. MOLLOHAN. Mr. Culberson.

CHINESE SPACE PROGRAM

Mr. CULBERSON. Thank you, Mr. Chairman.

Dr. Griffin, we talked last year a little bit about the Chinese and where they are going with their space program.

Do you think today, as we sit here today, that it is likely the Chinese will land on the Moon before we do?

Dr. GRIFFIN. I certainly believe that they can if they wish to.

Mr. CULBERSON. Can you talk to us a little bit about their plans and their program and the time table that they have set out to go to the Moon.

Dr. GRIFFIN. Well, China has not exactly laid out for us a blueprint of its space program. What they have announced is that their next flight to be conducted in the same timeframe as the Beijing Olympics will feature a crew of three. That is a very impressive feat for them on their third human space flight. Their third orbital flight will feature a crew of three. They have announced the intention to put up a small, I would call it a Salyut class Space Station like what Russia did in the late 1970s and early 1980s within their next few flights. I have no doubt that they will accomplish those goals. They are working on the development on the Long March Five which you can look on open sources on, you know, the web and find that they project to have a 25 metric ton carrying capacity and to be available in 2013. With four Long March Five launches, it is entirely possible to construct a scenario by which Chinese astronauts could be placed on the Moon. In my opinion, that could be done by late, in the next decade quite easily if they choose to do so. I find no fault with what they are doing. In fact, I admire their program. The Chinese are building a robust human spaceflight program, step by logical step in the very careful and very thoughtful way that they do everything else. So we should not be surprised by that.

Mr. CULBERSON. Sure. They could land on the Moon then before the end of the next decade. And when under our current schedule will Americans return to the Moon?

Dr. GRIFFIN. Under our schedule, in 2019 or 2020.

SEA TREATY LAW

Mr. CULBERSON. The law of the Sea Treaty has intrigued me and watching the Russians and others try to make claims to some of the mineral resources under the Arctic is in my mind, and correct me if I am wrong, but there is no law governing those mineral assets under the Arctic and there is no real established law or treaty governing who has ownership rights or can exploit the mineral resource, for example, mineral resources on the Moon or on an asteroid that is rich, true? Am I right or wrong about that?

Dr. GRIFFIN. I do not know anything at all about the law of the Sea Treaty, sir, or the Antarctic Treaty. I am sorry. We recently did, at Congressman Feeney's request, with benefit of external advisors as well, a study of the status of law and policy regarding lunar property rights.

Mr. CULBERSON. That is where I am driving at.

Dr. GRIFFIN. Okay. So that study has been completed internally. It requires review within the White House before it can be released. But when it can be released, it will be provided to you.

Again, I initiated that study at Mr. Feeney's request, but certainly it will be available to you as soon as we can make it.

Mr. CULBERSON. It is an important question that the Chairman was driving at that a little earlier, too, is about who has ownership rights or the ability to—because obviously the Moon is rich in resources. You got asteroids that are rich in resources. So I look forward to hearing it.

NEAR EARTH OBJECTS

Let me follow-up, if I could quickly, on the near earth objects and the charge from Congress, I think a number of years ago, that NASA identify asteroids of a kilometer in length.

Dr. GRIFFIN. Our requirement is to identify, by the end of this year, 90 percent of all the near-Earth objects of one kilometer or greater in size.

Mr. CULBERSON. And I know a part of that, because it was in some language that we in this Committee adopted year before last, Rusty Schweickart came in to see me several years ago. I think he was on the Apollo 9 mission and brought it to my attention. And it seems to me an important function of what you are doing identifying these objects is to how would you intercept one if you needed to nudge it out of the way?

What has NASA done in terms of trying to identify technologies or prepare for a mission if indeed one was spotted? Like, I think there was one last year that they thought for a while might have a chance of—would make a real close pass.

And I forget the name of the asteroid, but it is going to make a close pass and depending on how close it is in the year 2014, you will be able to see it visually from Europe. It will come so close to the Earth that I think in broad daylight, you will be able to see the thing whiz by. And Rusty showed me the calculations and it is going to come very, very close.

What contingencies has NASA prepared to send the mission out to nudge an asteroid out of the way if indeed it looked like it might strike the Earth?

Dr. GRIFFIN. We've prepared no such contingencies. We're not authorized by the Congress to do that mission. Money has not been appropriated for it, and the President has not directed us to do that.

ALPHA MAGNETIC SPECTROMETER

Mr. CULBERSON. OK. Obviously, you don't have enough money to do everything your plate right now. But it's something I just wanted to get on the record to find out where you were on it. I do think it's important. But we've got to make sure you have enough money for other requirements as well.

I'm glad to hear you're asking private contractors to find ways to get cargo to the Space Station.

If I could also, Mr. Chairman, just briefly ask about the—when the Texas delegation met with you a number of months ago, that's a cosmic ray experiment I think.

Dr. GRIFFIN. The AMS, the Alpha Magnetic Spectrometer.

Mr. CULBERSON. What are you doing to try to find a way to fly that? I know it would require—it has to fly on the shuttle in order to make it up to the Space Station. And about $1 billion has, I think, already been spent to get this thing ready. And commitments were made that it would be flown, I think. I know the University of Texas is heavily involved in it.

I'm not intimately familiar with it. But it is a very important science experiment that the scientific community is very supportive of, and is a high priority. Yet I don't understand. It's not going to be flown? What can be done to make sure that is on the manifest.

Dr. GRIFFIN. Allow me, if I might, to review the status of that with you.

Mr. CULBERSON. OK.

Dr. GRIFFIN. In last week's hearing before Senator Nelson we received a direct action to study a particular approach to manifesting the AMS by removing some of the spare parts that Mr. Mollohan mentioned earlier.

Mr. CULBERSON. And AMS stands for?

Dr. GRIFFIN. Alpha Magnetic Spectrometer.

Mr. CULBERSON. Okay.

Dr. GRIFFIN. That is the name of the experiment. We will, of course, answer that action. We will also answer the action to determine exactly what it would take to fly the AMS on a separate shuttle mission. So Mr. Gerstenmaier has those actions in work.

Mr. CULBERSON. Okay.

Dr. GRIFFIN. The results are not completed but they will be completed as soon as possible and furnished to the Congress.

Mr. CULBERSON. Broadly speaking, AMS is a 15,000 pound particle physics experiment. I am not a scientist, or certainly not a particle physicist, and I accept that it is a good piece of science to do. And I certainly know that in an earlier time commitments were made to fly it.

When we lost Columbia we drastically reduced the number of Shuttle flights, limiting them to those that were involved with the construction and maintenance of the Space Station until its completion. So a good deal of science has now been left on the ground by the reduction in Shuttle flights and the AMS was one of those. It does represent science with a substantial international commitment, as well an interagency commitment to DOE. And I understand that.

Mr. CULBERSON. About $1 billion has already been spent, is that right?

Dr. GRIFFIN. I am not arguing that point. So one of the damaging results out of the loss of Shuttle Columbia was leaving this experiment on the ground.

Mr. CULBERSON. $1 billion experiment.

Dr. GRIFFIN. Now there has been considerable advocacy to fly it. So I have said in the strongest possible terms that I do not recommend that the mission be directed to be flown if the consequences of flying that mission would be to remove Station logistics spare parts from the Shuttle manifest. I think that would be a poor trade. The Space Station is worth many of tens of billions of dollars and I just do not believe that it is wise to place it at risk to fly a science mission. I do not have the authority to direct adding one more Shuttle mission to the manifest. So I cannot take advantage of that. I do not have the money in the budget anywhere to make the changes to the AMS necessary to fly it on an expendable vehicle, or the purchase an expendable vehicle, and I do not recommend, as an engineer, making such changes to the experiment. They will be very costly and very difficult.

Mr. CULBERSON. Okay.

AUTHORITY TO CHANGE MANIFEST

Dr. GRIFFIN. So I do not recommend that.

Mr. CULBERSON. So the one option is find a way to get it on a shuttle flight. And you do have the authority, though, to change the manifest of what is flown on the shuttle.

Dr. GRIFFIN. But in the strongest possible terms I do not recommend, I recommend that you do not direct me to fly, to eliminate Station logistics units in favor of the AMS. I believe you would be putting at risk the Space Station in which we have many tens of billions of dollars of investment.

Mr. CULBERSON. Very quickly, just one last follow up. It only would require the removal of about 25 percent of one cargo I understand?

Dr. GRIFFIN. No sir, that is by volume. You would have to remove 43 percent by weight.

Mr. CULBERSON. Okay, so forty-three——

Dr. GRIFFIN. Which would be several racks of spare parts that we would want to take up.

Mr. CULBERSON. But you are doing this analysis for Senator Nelson I understand?

Dr. GRIFFIN. We are doing the analysis for Senator Nelson.

Mr. CULBERSON. We will see that on this Subcommittee as well. You will give it to us as well, I hope.

Dr. GRIFFIN. Yes, sir.

Mr. CULBERSON. I would like to ask for it. Thank you, Mr. Chairman, for being so indulgent with me. Thank you, sir.

[The information follows:]

International Space Station Impacts of Launching the Alpha Magnetic Spectrometer (AMS) on a Space Shuttle Logistics Flight

Introduction

Given the most recent information available, the conclusions from the February 2008 NASA report to the Congress on the Alpha Magnetic Spectrometer (AMS) still stand: the cargo capabilities of International Space Station (ISS) utilization flight (ULF) 3 – and potentially ULF4 and ULF5 if schedule allows them to be flown – are likely to be fully subscribed with hardware and logistics that can not (or can not cost effectively) be carried to ISS on anything but the Space Shuttle. Although NASA has done nothing to preclude flying AMS on the Space Shuttle before the Shuttle's retirement in FY 2010, a final decision does not need to be made until approximately February 2009. NASA has the opportunity to wait and observe ISS systems' performance to make a more informed decision about the spares requirements of ISS.

The first priority of the international space station partnership is a robust and viable ISS that is ready to support exploration and other goals after assembly is complete and the Space Shuttle is retired in 2010. It is important that NASA not put any single experiment, no matter its promise, ahead of the significant investment and future potential of the ISS partnership without serious consideration of the risks of that action.

Shuttle Manifest and ISS Operations

There are only eight assembly and logistics flights left on the Shuttle manifest with which NASA can complete the ISS by the end of fiscal year 2010 and deliver cargo for the post-Shuttle era. This makes Space Shuttle cargo capability an extremely limited and valuable commodity. Even if time allows for the two additional contingency logistics flights (ULF4 and 5) before 2010 retirement, the top priority for these flights is to ensure a robust configuration post-2010. This will enable as much flexibility as possible for engineers and mission planners.

NASA and its partners are only a few years into learning how to fly, operate, and maintain the largest and most complex facility ever constructed in space. Despite NASA successes thus far, the unprecedented scale of ISS construction and utilization activities in low-Earth orbit has challenged some initial assumptions about the on-orbit performance of ISS systems. To the credit of this international team of scientists and engineers, most ISS systems are lasting longer than anticipated. Other systems – like the control moment gyroscopes (CMG), the starboard beta gimbal assembly (BGA), and the starboard solar alpha rotary joint (SARJ) - have required maintenance sooner than was expected. The BGA has been repaired, and the failed unit was returned to Earth on STS-122 for analysis. This analysis will determine if there is a generic design flaw in the BGAs or if this is an isolated event. This determination is critical for developing the sparing requirements for the BGAs, and how much payload space will be required on the remaining Shuttle manifest. It should also be noted that both the BGA and the SARJ are needed for the solar arrays to track the sun and to provide power for the ISS. AMS would be a significant consumer of ISS power, and thus both the BGA and SARJ need to be repaired before serious consideration is given to mounting AMS on the ISS.

Shuttle Payload Planning

It takes several months to baseline a Space Shuttle flight. Engineers throughout NASA and its international partner community spend that time trading off between a number of critical, interrelated variables, including Shuttle mass and volume constraints; center of gravity; sequencing of hardware to ISS; power (both within the Shuttle cargo bay and on ISS); cargo bay hard points; the capabilities and constraints of other international partner vehicles; and internal and external stowage capabilities on ISS. Individual elements of that team each approach the manifesting challenge from their own perspectives. This plurality of voices benefits all, but it must be synchronized and vetted through established engineering decision-making processes. Taking any single position out of context may obscure the true complexity of the manifesting process.

Analysis to date indicates that manifesting AMS on a Shuttle flight would be technically very risky and would result in a significantly increased shortfall of spares to ISS. In general, while AMS may only occupy about 25 percent of the Shuttle cargo bay by *volume*, its 15,000 pounds mass would consume approximately 43 percent of the total launch capability of the Shuttle for a given flight. In addition, because AMS is a large and heavy payload, manifesting it along with other payloads would be problematic given the Shuttle's center-of-gravity requirements. This translates into a much more dramatic reduction in a mission's mass-to-orbit capability than is apparent on the surface.

From an integrated manifest standpoint, it is difficult to see how NASA would be able to manifest AMS on an existing Shuttle flight at this time. The packing of the cargo on the EXPRESS Logistics Carriers (ELC) in the Shuttle is the most launch and operationally effective way to deliver these spares to orbit. For example, multiple commercial cargo launches or three to five Japanese H-II Transfer Vehicle (HTVs) (if either is available) would be required to deliver the displaced cargo of one Shuttle ELC to the ISS. Commercial transportation is not currently available, and NASA does not plan to use HTV because it is not cost effective. As a result, the Shuttle is the only way to effectively deliver this time-critical hardware to orbit.

Following are some of the specific issues NASA has identified thus far with flying AMS on ULF3, or potentially the contingency flights ULF4 or ULF5 if schedule permits. Other challenges with flying AMS on either Shuttle or another vehicle are addressed in the AMS report delivered to Congress in February 2008.

Reconfiguring ULF3

In August 2009, ULF3 will deliver two fully populated ELCs with assembly hardware, science experiments and pre-positioned spares critical to the operation of the ISS. Each ELC is an external platform that provides mechanical mounting surfaces, electrical power, and command and data handling services for up to 9,800 pounds of unpressurized cargo, including two science payloads. It is important to recognize that the logistics carriers are more than just carriers to be used for the Shuttle flights. They are also the mounting pallets that must be used to store components (either spares or experiments) outside on the truss of the ISS.

Together, the two ELCs manifested on ULF3 will deliver eleven pre-positioned spares and two science experiments with a combined mass of approximately 18,200 pounds. Launch and stowage of the pre-positioned spares will facilitate sustaining ISS through 2015, since maintenance after Shuttle retirement must either occur using an on-orbit inventory of spare parts or commercial cargo services. Launch and activation of the ELC-based science payloads is useful to the operation of the ISS as an international facility conducting important space research. The mass of the AMS is too great compared to the total mass of these smaller science payloads to allow for a manifest change. In other words, even if all of these smaller pieces were removed, there would still not be room to fly AMS.

Although the ULF3 flight could potentially be reconfigured to deliver just one ELC and AMS, it would be at the expense of losing or delaying the delivery of approximately 10,700 pounds of cargo that supports ISS viability after Shuttle retirement. Only the Space Shuttle currently has the capacity to effectively transport an ELC to the ISS; failure to launch an ELC on the ULF3 Shuttle flight could result in a permanent loss of external stowage and experiment capacity for the ISS.

Co-manifesting AMS and an ELC on the same Shuttle flight would require AMS to be placed in the aft portion of the payload bay due to the need to maintain proper weight and center of gravity. The maximum total weight for the companion ELC would be reduced to approximately 12,000 pounds, decreasing the maximum cargo capability from 9,800 pounds to 7,500 pounds. This is significantly less than the manifest planned for the carriers on ULF3. Therefore, the total impact of launching AMS on ULF3 is the loss of an entire ELC worth of cargo, plus the loss of approximately 1,100 pounds from the remaining ELC. This reduction of pre-positioned spares delivered on ULF3 further increases NASA's reliance on limited or yet-to-be demonstrated non-Shuttle launch opportunities. The loss of an ELC and the external platform it provides for unpressurized science experiments would pose challenges to ISS operations and capability to support other important planned space research.

Using a Contingency Flight

ULF4 and 5 are the Shuttle contingency flights that will only be flown if they can be completed before the end of 2010.

ULF4:

If approved, ULF4 would deliver an Integrated Cargo Carrier – Vertical Light Deployable (ICC-VLD) and the Docking Cargo Module (DCM) in February of 2010. The ICC-VLD is an external platform used to ferry up to 6,560 pounds of unpressurized cargo to and from the ISS; the ICC-VLD returns with the Space

Shuttle and does not become a permanent part of the ISS. The ICC-VLD would deliver maintenance and assembly hardware, as well as a pre-positioned spare, with a combined mass of approximately 5,900 pounds. Six power system batteries would be replaced during the ULF4 mission to allow ISS operations through 2015. The Enhanced Orbital Replacement Unit (ORU) Temporary Platform would increase the efficiency of robotics operations, and delivery would augment on-orbit inventory of spares in order to maintain ISS through 2015.

The DCM is a pressurized module built by the Russian Space Agency, Roscosmos, which would deliver 3,086 pounds of United States On-orbit Segment (USOS) internal cargo, as well as approximately 3,400 pounds of cargo as part of the U.S. contribution to the ISS partnership. The DCM would become a permanent part of the ISS, providing a docking port, additional habitable volume, and external stowage for Russian Segment outfitting.

ULF4 could potentially be reconfigured to deliver the ICC-VLD and AMS, but at the risk of losing the DCM and its associated accommodations. NASA would undergo significant technical challenges in potentially reconfiguring an ELC on ULF5 to deliver and stow the external outfitting for the Russian Segment, reducing pre-positioned spares and science experiments by approximately 8,500 pounds. In addition, the loss of 3,086 pounds of USOS internal cargo would force NASA to rely on limited pressurized resupply opportunities.

Alternately, ULF4 could be reconfigured to deliver the DCM and AMS, at the expense of losing or delaying approximately 5,900 pounds of cargo. However, due to the substantial weight of each element, significant technical challenges would exist in accommodating the DCM and AMS on the same Shuttle flight. In this configuration the AMS would have to be flown in the forward position of the payload bay. Considerable structural and loads issues are expected regarding the placement of the approximately 15,100-pound AMS in the forward position of the payload bay. For this reason, this configuration does not now appear to be supportable from a Shuttle payload bay loads standpoint.

Even assuming the Shuttle can physically support AMS in this configuration, the Shuttle would still run a negative mass margin (approximately 4,000 pounds) unless other items were de-manifested from ULF4.

ULF5

If ULF5 is approved, the impacts of flying the AMS on this contingency flight are very similar to the impacts described on ULF3. The weight impact of flying AMS on ULF5 is slightly less, but this flight would require removal of spares that are best flown on the Shuttle. For example, accommodating AMS on ULF5 would remove express logistics carrier number 4. This carrier would carry a fourth high pressure oxygen tank to support ISS space walks, a battery charge discharge unit, an S-Band antenna support assembly and a spare robot arm for Dextre. The high pressure O2 tank does not fit on another launch vehicle without major redesign, and is critical to ISS basic operations.

Summary

NASA has done an exhaustive look at flying AMS on the Space Shuttle. NASA has carefully evaluated all suggestions and has looked creatively for any options to fly AMS on the remaining eight assembly and logistics flights, or potentially the two contingency logistics flights, before 2010 retirement. Until engineers better understand the performance of ISS systems and gain experience in operating the new systems on ISS, however, replacing critical hardware with the AMS poses risks to ISS operations.

Flying and operating ISS is one of the most complicated tasks that NASA has ever attempted, and therefore requires margin in order to be successful. NASA will continue to evaluate the hardware performance on ISS. If the observed performance of ISS systems proves to be better than predicted, NASA may reevaluate the option of replacing spares with AMS before a final decision is necessary in February 2009. Making a decision to fly AMS before then, only to find that the ISS has not been properly outfitted to support long-duration science experiments or power requirements, is not prudent.

Mr. MOLLOHAN. Thank you, Mr. Culberson.

Mr. CULBERSON. Thank you, Dr. Griffin.

IRAN, NORTH KOREA AND SYRIA NON-PROLIFERATION ACT (INKSNA)

Mr. MOLLOHAN. Dr. Griffin, you need authorizing legislation, do you not, to permit you to buy sole use flights from Russia beyond 2011?

Dr. GRIFFIN. Yes, sir.

Mr. MOLLOHAN. What is the status of that? Are you in conversations with the authorizing committees about that?

Dr. GRIFFIN. We are in conversations within the Administration to produce a coordinated request from the Administration for such additional exemption going beyond 2011. We have the exemption until 2011. I have notified the authorizing committees that, as a courtesy if you will, that they should expect such a request, that we are working within the Administration to obtain it. That the consequences of failure to get that exemption would be that there would not be any U.S. crew on the Station after 2012, nor would we be able to complete our existing obligations to our international partners to fly their crew.

Mr. MOLLOHAN. What authorizing committees have jurisdiction?

Dr. GRIFFIN. I believe that the House and Senate Foreign Relations Committees have jurisdiction over this. But of course, I have to also notify my authorizing Committees and am doing so.

Mr. MOLLOHAN. So the committees that have jurisdiction that will move the legislation is Foreign Affairs Committee?

Dr. GRIFFIN. I believe that is right, sir.

Mr. MOLLOHAN. And when would be the last date that you would have to have this authorization as a matter of practicality in order to negotiate with the Russians a deal?

Dr. GRIFFIN. As a practical matter, let me work backwards. As a practical matter, we need to fly in the Spring of 2012 a crew. We would have a normal crew flight, logistics flights, in the Spring of 2012. There is a three-year production sequence, for the Soyuz system. So we would have to have a contract in place, up and running, by the Spring of 2009 with the Russians. So as a practical matter, by this time next year, in order to have an uninterrupted logistics plan, I would have to have a contract in place with the Russians. Backing up from that then——

Mr. MOLLOHAN. You really need this authorization this year.

Dr. GRIFFIN. I do, sir.

Mr. MOLLOHAN. Does the Administration plan on coming forward with the request?

Dr. GRIFFIN. We have so far nothing but positive indications from within the, we have had not negative conversations within the, Administration. It is just a matter of coordinating carefully with all of the stakeholders to produce a request that is fully coordinated among all the appropriate parties.

Mr. MOLLOHAN. You would think the Appropriations Committees would have a room either in some office building or in the Capitol that we owned that we could control hearings, would you not?

Dr. GRIFFIN. Well, you too sir are with government, as are we, and I think we all know the efficiency of government.

Mr. MOLLOHAN. Now what should we do about that?

Dr. GRIFFIN. Would you like to come over to NASA and resume the hearings? I am certain I can find a room for you.

CHAIRMAN'S CLOSING REMARKS

Mr. MOLLOHAN. This is a Ways and Means Committee room and we are ten minutes past due in turning it over to them. And we have a lot of other, I mean, aeronautics questions, you have folks here who we have not even spoken to. But we are going to bid you all a goodbye and submit a lot of questions for the record. Mr. Frelinghuysen cannot be here this afternoon so we very much appreciate your attendance. We appreciate the excellent work you and your staff—these guys are smiling—do for us and we look forward to working with you. And if you would be forthcoming in answering our questions that we submit for the record we would appreciate it. Thank you, Dr. Griffin.

ADMINISTRATOR GRIFFIN'S CLOSING REMARKS

Dr. GRIFFIN. Thank you, sir. We will answer all questions as expeditiously as possible. I would like to say for just a moment that I do recognize that there are of course differences between this Committee's views and those of the Administration. I very much appreciate your support of us and our plans for the Space Program to the extent that you have been able to do that, and very much appreciate the collegial working environment that I think we have established. Thank you.

CHAIRMAN'S CLOSING REMARKS

Mr. MOLLOHAN. Thank you, and we are going to work very hard. You see the support on the Committee. It is just scarce, we have the same issues at trying to find money that you do. But we are going to work very hard to see in some of these areas if we cannot get you additional resources. Thank you, Dr. Griffin. Thank all the witnesses here today. Thank you to everybody.

Dr. GRIFFIN. Thank you, Mr. Mollohan. Thank you, Mr. Frelinghuysen.

Mr. MOLLOHAN. The hearing is adjourned.

[Whereupon, at 12:42 p.m., the Subcommittee was adjourned.]

[Questions and answers submitted for the record follow:]

Written questions submitted by Rep. Mollohan resulting from the March 5-6, 2008, hearing before the House Subcommittee on Commerce, Justice, Science and Related Agencies regarding NASA's FY 2009 Budget Request.

OVERALL BUDGET LEVELS

QUESTION 1:

Mr. Administrator, in addition to Shuttle and Space Station operations, development of a new human space transportation system, NASA's budget also supports crucial aeronautics research, space science and technology applications. Surely, these important activities and the ambitious human lunar program will necessitate investments in excess of the modest increases of about 2 percent annually until FY 2013 that are presumed in your request, particularly given NASA's history of costs growth and schedule delays. Wouldn't you agree?

ANSWER:

No. Having analyzed historical NASA budget data, I've concluded, and written elsewhere, that: "[Assuming] funding stability in constant [, inflation adjusted] dollars ..., the total [NASA funding] in every subsequent decade will match that of the Apollo development decade, 1959-1968. Expressed in a slightly different way, NASA could carry out a complete Apollo-scale effort every 15 years between the present day and the 100th anniversary of Sputnik."

QUESTION 2:

Can you provide the Committee a back-of-the-envelope estimate of the out-year budget growth required by the middle of the next decade to accomplish all the tasks currently on your agenda?

ANSWER:

Stable budgets in the outyears will greatly facilitate accomplishment of the tasks currently ascribed in the NASA, requiring at the maximum increases that are no greater than inflation.

QUESTION 3:

What changes in your program of tasks would you recommend if a future Administration or Congress is unwilling or unable to provide such growth?

ANSWER:

I believe the budget priorities and their associated program of record is the right set of tasks for future Administrations and future Congresses. Funding stability is paramount to the success of NASA to execute the Presidential and Congressional goals, which, in my view, are the best set of goals in the past 40 years for the Agency.

FUNDING LEVELS TO MEET AMERICA COMPETES ACT AND PROVIDE BALANCE AMONG ACTIVITIES

QUESTION 4:

Administrator Griffin, the FY 2009 budget for NASA provides an increase of 1.8 percent over the FY 2008 enacted level, which does not even keep pace with inflation. Within the budget totals, your agency is proposing cuts of 21 percent in important education programs and 13 percent in aeronautics. Science is flat-funded. In this context, would you consider your budget request "balanced?"

ANSWER:

Yes. The FY 2009 NASA budget request reflects the priorities and goals contained in the President's civil space exploration and aeronautics research policies, and it is also consistent with the NASA Authorization Act of 2005 (P.L. 109-155) that enacted those goals The NASA budget request is 'balanced' with respect to Agency's direction and guidance from the White House and Congress.

NASA's FY 2008 enacted budget was $17.1 billion after accounting for the rescission of unobligated balances. NASA's FY 2009 budget request of $17.6 billion is a 2.9% increase over that level.

QUESTION 5:

Some scientists have expressed concern that NASA's budget is not balanced appropriately – favoring human space flight activities to science and aeronautics research and development. How does NASA determine its allocation between science, aeronautics, education, exploration and human space flight programs?

ANSWER:

The FY 2009 NASA budget request reflects the priorities and goals contained in the President's civil space exploration and aeronautics research policies, and it is also consistent with the NASA Authorization Act of 2005 (P.L. 109-155) that enacted those goals.

QUESTION 6:

How does NASA respond to the concerns expressed by scientists regarding your budget?

ANSWER:

NASA explains that we are a multi-mission agency, with responsibilities in space exploration, science and aeronautics. We receive direction from both the Executive and Legislative branches in all three areas, and that direction reflects the need for

NASA to make progress in all three areas on behalf of the Nation in an environment of limited budgetary resources. NASA believes it has struck the optimal balance to make progress in all three areas within the resources provided.

QUESTION 7:

In your view, should NASA's science programs be added to the American Competitiveness Initiative?

ANSWER:

NASA is grateful for the guidance and support expressed by the Congress in the America COMPETES Act and the NASA Authorization Act of 2005. While NASA believes the American Competitive Initiative (ACI) is important for the Nation and partners with the Federal agencies included in the ACI, other Executive branch policy initiatives guide NASA activities, including the U.S. Space Exploration Policy (guiding both human and robotic space exploration), National Aeronautics Research and Development Policy, and several policy initiatives related to Earth science. While NASA would welcome appropriations at the levels of the NASA Authorization Act of 2005, the Agency recognizes the challenges with budgeting and appropriating higher than current levels in a time of Federal budget deficits. NASA believes that the Agency can make substantial progress on the tasks the Executive and Legislative branches have assigned to the Agency within the budget level requested.

QUESTION 8:

What actions have you taken to enhance NASA's contribution to promote innovation and U.S. economic competitiveness?

ANSWER:

All of NASA's Innovation Partnerships Program (IPP) elements promote innovation and contribute to increased U.S. commercial activity and economic competitiveness. IPP's program elements consist of: *Partnership Development*, which includes traditional Technology Transfer Out, Intellectual Property Management, and dual-use Technology Development Partnerships; *Technology Infusion*, which includes the IPP Investment Seed Fund and the Small Business Innovative Research (SBIR)/Small Business Technology Transfer (STTR) programs; *Innovation Incubator,* which includes Centennial Challenges as well as new initiatives such as facilitating the purchase of services from the emerging commercial space sector. Thus, IPP's traditional Technology Transfer Out program element is only one of several ways in which IPP contributes to the Nation's economic development. IPP has either strengthened or newly created its program elements to better facilitate technology innovation and thus better serve Agency needs and contribute to U.S. economic competitiveness. In addition, the IPP program has been relatively recently re-located in the NASA organization so that it now reports to NASA top management at the highest levels. The Program is, therefore, better positioned and more able to serve its Cross-Agency Support mission in the national interest.

IPP's Technology Transfer Out function involves licensing of NASA technologies for commercial application and other public benefit. In FY 2007, IPP facilitated signing of 35 license agreements and 598 software use agreements. The Intellectual Property Management function enables the reporting of new NASA invention disclosures. As a result of IPP's FY 2007 and prior years efforts, over 100 NASA patent applications were filed and 93 patents awarded in FY 2007. The Intellectual Property Management function therefore complements the Technology Transfer Out function by facilitating protection of the technology that becomes the subject of NASA licenses.

IPP facilitates NASA's entering into dual-use Technology Development Partnerships. From NASA's perspective, the primary purpose of these partnerships is to provide needed technology and capabilities for NASA's Mission Directorates, Programs, and Projects at less cost through investments and partnerships with private and other external entities. At the same time, these partnerships enable industrial entities to jointly develop commercially applicable technologies at less cost to them. In addition, industry can take advantage of the Agency's unique capabilities and facilities through partnering. The technology spectrum of interest to NASA is so broad that it is difficult to imagine a key industrial sector that could not benefit from partnering with NASA. In FY 2007, IPP facilitated NASA's entering into over 200 such partnerships with private and other external entities. Over the past two years, IPP significantly strengthened the targeting of its technology development partnering initiatives to particular technology gaps of NASA's Mission Directorates. The likelihood of business ventures being created to meet the Agency's technology needs is thereby enhanced, with commercial application of those technologies inevitably resulting as byproduct.

Similarly, IPP's Investment Seed Fund is a new project element designed to enhance NASA's ability to meet mission technology goals by providing seed funding to address barriers and initiate cost-shared, joint technology development partnerships. Seed Fund projects encourage, to the maximum extent possible, leveraging of funding, resources, and expertise from non-NASA partners, NASA Programs and Projects, and NASA Centers. Over the life of IPP's Investment Seed Fund, which spans FY 2006-2007, IPP's $15.9M investment has generated 67 partnerships and resulted in $26.3M in private capital investment contributed by industrial partners and $20M in contributions from NASA's other programs and projects, for a total of $62.2M for the advancement of Agency critical technologies also having significant commercial applicability.

IPP's SBIR/STTR program provides the small business sector with the opportunity to provide mission use technology for NASA. At the same time, historically, about 30 percent of NASA's phase II SBIR/STTR technologies have been commercially applied in key sectors such as aviation, agriculture, automotive manufacturing, advanced materials, communications, electronics, environment protection, sensors, robotics, medicine, manufacturing, heating/air conditioning, optical instrumentation, computing, and software development. Within the past year, NASA transitioned its SBIR/STTR program to a new model that is more efficient and better serves the technology needs of the Agency. Therefore, NASA's SBIR/STTR program element encourages private capital investment in business ventures to meet the Agency's technology needs and, as a byproduct, increases the likelihood of commercial application of NASA SBIR/STTR technology.

Centennial Challenges is IPP's relatively new program of prize contests to stimulate innovation and competition in NASA mission areas. By making awards based on actual achievements, instead of proposals, Centennial Challenges seeks novel technological solutions to NASA's mission challenges from non-traditional sources of innovation in academia, industry, and the public. As a byproduct, Centennial Challenges is sparking inventive genius and real technology advances created by individuals, academia, and corporations of all sizes, thus providing the basis for future commercial applications and related private capital investment.

NASA recently made a selection in a competitive procurement to provide commercial parabolic aircraft flight services to simulate multiple gravity environments. IPP will utilize this contract to initiate a new activity – Facilitated Access to the Space environment for Technology development and training (FAST). FAST will provide partnership opportunities involving technology development that relies on limited exposure to the microgravity environment. FAST has the dual objectives of demonstrating the purchase of commercial services from the emerging commercial space sector, and advancing maturity of dual-use technologies through use of those services.

With respect to advancements in IPP program implementation efficiencies, IPP is in the process of improving its website and its publications, *Spinoff Magazine*, T*echBriefs Magazine*, *Innovation Magazine*, for the purposes of generating increased interest in, and making licensing, partnership development, as well as other opportunities available to a broad range of entities, nationwide. In addition, IPP is improving its information technology capabilities that are expected to increase new technology reporting compliance, and improved partnership development management.

Accordingly, the IPP program, through its various program elements, provides the opportunity for a broad spectrum of industry, large and small companies alike, to create or join NASA in creating innovative technology, contribute to NASA's missions, and simultaneously enhance their own competitive positions in international markets. IPP also challenges the ingenuity of grass roots citizens, inviting entrepreneurs, inventors, and students alike to create innovative technology and thereby contribute to NASA's missions, as well as to help build the foundation for the Nation's future economic prosperity.

QUESTION 9:

What are some recent contributions by NASA to U.S. economic competitiveness and the Nation's quality of life?

ANSWER:

Industrial Productivity

- NASA creates technologies that are often expected to function in high-stress, high-heat, critical environments. These technologies often find their ways into the manufacturing processes here on Earth, where composite materials, stress tests, safety innovations, insulating materials, and advanced lubricants all contribute to the Nation's economic competitiveness. Recent NASA technologies transferred have yielded benefits that strengthen structures, boost data transmission, enhance precision fabrication, broaden sensing horizons, resist extreme heat and stress, develop ultra-hard steel, save time and energy, streamline production, control noise and vibration, and advance thermal management. Two such examples are:

  > *Novel Nanotube Manufacturing Streamlines Production*: Idaho Space Materials Inc. (ISM) licensed a NASA developed process for creating single-walled carbon nanotubes. The company now utilizes this process in manufacturing inexpensive, robust nanotubes for use in creating next generation composite polymers, metals, and ceramics. Researchers are currently examining ways to use these materials in a myriad of technologies, which would include transistors, fuel cells, televisions, super-capacitors, catalysts, and advanced composite materials.
  >
  > *'NASA Invention of the Year' Controls Noise and Vibration*: NASA's Macro-Fiber Composite (MFC) is designed to control vibration, noise, and deflections in composite structural beams and panels. Smart Material Corporation licensed the NASA's MFC technology to add it to their line of commercially produced actuators. To date, the company has sold MFCs to over 120 customers, including Volkswagen, Toyota, Honda, BMW, General Electric, and the tennis company, HEAD. Consumer applications already on the market include audio speakers, phonograph cartridges, microphones, and products requiring vibration control such as sports equipment.

Computer Technology

- NASA remains on the cutting edge of advanced computing, best evidenced by the Columbia supercomputer at Ames Research Center, which is not only making it possible for NASA to achieve breakthroughs in science and engineering for the Agency's missions, but is also available to the general scientific community for projects such as understanding how turbulence starts in high-speed airflow over air vehicles, accelerating the realization of simulation-based design of ships, reducing the pollution produced by power generation, and predicting future global climate change through analysis of the world's oceans.

- Recent NASA technologies transferred from research related to space telescopes and deep space exploration, aeronautics, the Space Shuttle, the International Space Station, and satellites and imaging technology have yielded benefits that simplify analysis and design, translate 2-D graphics to 3-D surfaces, improve health and performance monitoring, enable smarter content management, and validate system design. Two such examples are:

> *Design Application Translates 2-D Graphics to 3-D Surfaces*: NASA developed a flattening process to translate surface geometry of a model to a 2-D template. Fabric Images Inc., specializing in the printing and manufacturing of fabric tension architecture for the retail, museum, and exhibit/trade show communities, utilizes software derived from the NASA technology to translate 2-D graphics for 3-D surfaces prior to print production. Benefits of this process include 11.5 percent in project time-savings, less material wasted, as well as the ability to improve upon graphic techniques and offer new design services.
>
> *Hybrid Modeling Improves Health and Performance Monitoring*: A NASA SBIR contract helped Scientific Monitoring Inc. create a simplified health monitoring approach for flight vehicles and equipment. I-Trend, the resulting product, compares equipment performance to design predictions to detect deterioration or impending failure before operation is impacted. Several commercial aviation programs use I-Trend technology, and the U.S. Air Force tapped the company to develop next-generation engine health-management software.

Agriculture and Environment

- Under NASA's Small Business Technology Transfer (STTR) program, SpecTIR, LLC developed a hyper-spectral crop-imaging technology to enhance airborne sensing and ground-truth validation for crop inspection. In farming, the application of water, pesticides, or fertilizer can be tailored to the needs of crops, based on conditions exposed in hyper-spectral imagery. Other areas of application for this technology include pollution and contamination monitoring; wetland and forestry characterization; water quality assessment; oil, gas, and mineral exploration; and submerged aquatic vegetation mapping.

- NASA's research has enhanced our understanding the Earth and how to preserve it. Using remote sensing data from satellites, NASA scientists provide us with a better understanding of the causes and effects of global climate change. NASA's technologies have also advanced irrigation and crop management techniques for farmers around the world. Recently documented cases of related NASA technology transfer have yielded benefits that map, monitor, and manage Earth's resources, provide environmental data, save energy, prolong motor life, and prevent corrosion in steel and concrete structures. Two such examples are:

Advanced Systems Map, Monitor, and Manage Earth's Resources: Under a NASA STTR contract, SpecTIR LLC developed a hyper-spectral imaging technology for crop inspection. The technology is now applied in precision farming and irrigation. Other applications include oil, gas, and mineral exploration pollution and contamination monitoring; wetland and forestry characterization; water quality assessment; and submerged aquatic vegetation mapping.

Treatment Prevents Corrosion in Steel and Concrete Structures: A NASA-developed electro-chemical technique and coating to prevent corrosion was combined with Surtreat Holding LLC's chemical anti-corrosive solution for coating applications which include bridge and building infrastructures, piers and docks, parking garages, cooling towers, and pipelines. Surtreat's Total Performance System, a natural complement to the coating, provides diagnostic testing and site analysis, prescribes and manufactures site-specific solutions, controls material application, and verifies performance through follow-up testing and analysis.

- NASA and the University of Central Florida partnered to develop a biodegradable environmental cleanup technology – Emulsified Zero-Valent Iron (EZVI). EZVI uses iron particles in an environmentally friendly oil and water base to neutralize toxic chemicals. NASA's EZVI technology is now being use to restore contaminated sites in Arkansas, California, Florida, North Carolina, and Texas. The Environmental Protection Agency (EPA) estimates that the particular toxic chemicals targeted by EZVI are present at 60 to 70% of all sites on the Superfund National Priorities List.

- Under a NASA SBIR contract, Osmotek, Inc. created a technology to treat leachate (toxic chemicals) on-site at municipal or industrial landfills by filtering the water and leaving behind the leachate, which can then be solidified into a substance to preclude it from seeping into ground water and eventually reaching lakes and rivers.

- Petroleum Remediation Product (PRP) was invented based on NASA's micro-encapsulation technology, which is used to clean up environmental hazards such as oil spills. The basic technology behind PRP is thousands of microcapsules—tiny balls of beeswax that contain microorganisms. Water cannot penetrate the microcapsule's cell, but oil is absorbed right into the beeswax spheres as they float on the water's surface. This way, the contaminants—chemical compounds that originally come from crude oil such as fuels, motor oils, or petroleum hydrocarbons—are caught before they settle. The microorganisms degrade hydrocarbons in petroleum, transforming them into harmless carbon dioxide and water.

Public Safety

- Last fall, NASA used its technologies to aid Californians during wildfires that ravaged Southern California. NASA use its Earth-observing satellites to help monitor the spread of the fires, and also sent an unmanned aerial vehicle equipped with unique IR sensors to fly over the fires to peer through heavy smoke and darkness, find hot spots and flames, and transmit the sensor information to a NASA Ames Research Center computer server. At Ames, the information was combined with Google Earth maps and then transmitted, within minutes of acquisition, to operations centers to provide firefighters with a much better understanding of the situation as well as aid disaster managers in allocating firefighting resources. Information gathered from piloted airplanes currently must wait for the aircraft to land before it can be transmitted.

- NASA collaborates with the University of Maryland, the USDA's Forest Service (USFS), and NOAA to provide firefighters with the most up-to-date maps and satellite images from NASA's Terra and Aqua satellites to help them strategically plan their response. After the fire is under control, land managers can use the information to assist them in planning for rehabilitating the burned area and for protecting water quality in the affected area.

- Data from NASA satellite missions make significant contributions in the area of hurricane and flood prediction. NOAA utilizes satellite-derived estimates of precipitation and wind speed and direction from NASA spacecraft to substantially improve the accuracy of forecasts for hurricane landfall, track, and intensity as well as increases the lead-time for warnings for both hurricanes and floods.

- *Chemical-Sensing Cables Detect Potential Threats*: Under NASA's SBIR program Intelligent Optical Systems Inc. developed moisture- and pH-sensitive sensors to detect corrosion or pre-corrosive conditions before significant structural damage occurs. The sensors can also be applied to detect chemical warfare agents. The company has sold these sensors to major automotive and aerospace companies, who are finding a variety of uses for the devices.

- *Infrared Imaging Sharpens View in Critical Situations:* Innovative Engineering and Consulting Infrared Systems received NASA assistance in developing commercial infrared imaging systems that better differentiate the intensity of heat sources. The research resulted in the NightStalkIR and IntrudIR Alert Systems, now being used to locate personnel stranded in emergency situations and protect high-value operations. The company is also applying its thermal imaging techniques to medical and pharmaceutical products.

- NASA needs technologies for remote delivery of medical care – or telemedicine – for long-duration spaceflight missions. To help develop those technologies, the National Bio-computation Center was established as a partnership between the Stanford University School of Medicine's Department of Surgery and NASA's Ames Research Center. In early 2005, researchers at the National Bio-computation Center formed a spinoff company, Intelesense Technologies, to use telemedicine sensors for earthbound applications. Employing networks of wireless sensors for air, water, weather, and imagery, and then integrating the sensor information with other data sources, Intelesense helps clients better understand how environments and people are linked, monitor and protect natural resources, track emerging infectious diseases such as avian influenza, predict and adapt to environmental changes, provide for sustainable development, reduce the costs and impacts of natural disasters, and provide an effective and intelligent response to such disasters.

Health and Medicine

- Applications of NASA's technology have produced health care innovations that improve CPR, detect cardiovascular disease, assist patients with cognitive disorders, evaluate nerve function, fight acne, broaden cellular analysis, and enhance diagnostic imaging. Two such examples are:

  Circulation-Enhancing Device Improves CPR: NASA studies on cardiovascular responses and fluid shifts in the body for astronaut life support led to collaboration with Advanced Circulatory Systems Inc., to develop the ResQPOD Circulatory Enhancer, a device that improves the standard of care provided to patients with a variety of clinical conditions due to low blood flow.

  Noninvasive Test Detects Cardiovascular Disease: NASA's Video Imaging Communication and Retrieval software for analysis of images from Mars provided a basis for developing imaging technology to analyze X-ray images of soft tissue. The same methodology applied to ultrasound imagery resulted in a non-invasive diagnostic system with the ability to accurately evaluate heart health.

Transportation

- The vast majority of today's commercial aircraft fleet has benefited in some way from NASA's advanced aeronautics research. Recently documented cases of NASA technology transfer from aeronautics research have yielded benefits that ease air traffic management, advance rotorcraft design, improve flight safety, boost helicopter performance, and protect general aviation aircraft. Two such examples are:

  Comprehensive Software Eases Air Traffic Management: Flight Explorer, Inc. licensed NASA's Future Air Traffic Management Concepts Evaluation Tool and commercially applies this software to provide automatic alerts of events such as weather conditions and potential airport delays, with real-time coverage over Canada, the United Kingdom, New Zealand, and sections of the Atlantic and Pacific Oceans. The company recently formed several partnerships to expand coverage worldwide.

  Deicing System Protects General Aviation Aircraft: Through

NASA's SBIR program, Kelly Aerospace Thermal Systems LLC collaborated with NASA scientists on deicing technology. The result is a lightweight, easy-to-install, and reliable wing and tail deicing system, called Therma-wing.

VISION FOR U.S. SPACE EXPLORATION

QUESTION 10:

How is NASA able to meet the timetables presented within President's Vision and meet its other core missions within these continuing constrained budgets? Something has got to give, doesn't it, Dr. Griffin, either the budget or the schedule, or maybe both?

ANSWER:

No. The FY 2009 NASA budget request reflects the priorities and goals contained in the President's civil space exploration and aeronautics research policies, and it is also consistent with the NASA Authorization Act of 2005 (P.L. 109-155) that enacted those goals. The NASA budget request is 'balanced' with respect to Agency's direction and guidance from the White House and Congress. Having analyzed historical NASA budget data, I've concluded, and written elsewhere, that: "[Assuming] funding stability in constant [, inflation adjusted] dollars …, the total [NASA funding] in every subsequent decade will match that of the Apollo development decade, 1959-1968. Expressed in a slightly different way, NASA could carry out a complete Apollo-scale effort every 15 years between the present day and the 100th anniversary of Sputnik."

QUESTION 11:

I understand that space experts and advocates from NASA, industry, academia and advocacy groups gathered at Stanford a few weeks ago and discussed whether the U.S. is on the right track in its plans to reach the Moon by 2020, build a long-term lunar base there and eventually sends humans to Mars. You have been reported as saying that the questions raised at the conference have been asked and answered and that many voices were heard in planning the program, which Congress finalized in 2005. Is that an accurate characterization of your views?

ANSWER:

It is an accurate reflection of my statements. What the next step should be for the Nation's human spaceflight program has long been debated within NASA and without. That debate was revisited with particular vigor as the White House was working with NASA to develop 2004 Vision for Space Exploration. We even thought about it and discussed it during our work on the Exploration Systems Architecture Study. The conclusion that was reached then, which still stands today, is that traveling to the Moon and using it as a test bed for human activity away from the Earth in advance of human trips to Mars is the right thing to do. I have made sure that our architecture is sized to support human trips to Mars, and I believe our

Nation will one day will place astronauts on Mars, but we are not yet ready to go. Among other things, we have to learn about crew survival on a different planet, about how to support a crew that is living far away from home with no immediate way to return or way to get to them, and how to live off the land and use the resources provided in situ to support ourselves.

The group that gathered at Stanford University recently ultimately came to this same conclusion – as was reported perhaps most prominently in a Space News article – and I believe any objective analysis would continue to support that conclusion.

QUESTION 12:

Given the reality that the President's budgets since the Vision announcement have fallen short by almost $4 billion and the resources needed to implement the Vision have been further eroded by costs such as Return to Flight (additional billions of dollars), isn't a mid-course correction or review appropriate? If not, when would such a review be appropriate or necessary?

ANSWER:

The plan NASA has to develop the next generation of human-rated spacecraft and return to the Moon is still the right plan. As I have described on previous occasions, our plan for both the Ares I and Ares V launch vehicles is the best plan we can conceive of to meet NASA's goals. As described by the President and authorized by Congress, these goals include the development of vehicles to return humans to the Moon and beyond. Furthermore, the Congress directed NASA to utilize Shuttle-based hardware and personnel to the maximum extent possible in developing these vehicles.

The ability to both return to the Moon and in addition be capable of supporting the ISS was considered carefully during the Exploration Systems Architecture Study; but we considered other objectives as well. In particular we considered the fact that aerospace systems often remain in use for decades, and, so, if we are to send human missions to Mars, we are likely going to do so using many of the systems we are developing today. So with an eye toward Mars, a focus on our stated mission objectives, and extensive technical analysis, we formulated what is now our plan for developing the Orion, Ares I, and the heavy-lift Ares V.

The alternatives to the Ares I/Orion approach that we considered in the past, and the alternatives being offered in many quarters today, would lead to either insufficient capabilities or increased total costs to the taxpayer, if not both. A mid-course correction would slow our progress, but even worse, it would only lead us toward what NASA believes is the wrong answer for our space program.

A change to our plan, an alternate course, would only be warranted if NASA were given new objectives--frankly, if NASA were to be directed not to pursue plans for human spaceflight beyond low-Earth orbit. Let me be clear – there is, of course, sensitivity in our plans to funding provided. I have made sure that our plan is executable given funding constraints, but I have also operated under the assumption that there is a commitment to move our space program beyond low-Earth orbit. I believe this commitment is expressed in both U.S. Space Exploration Policy and the NASA Authorization Act of 2005 (P.L.109-155), and I believe it is a commitment that will have to manifest itself in funding appropriations that match our budget requests for several years. Stated more simply, NASA needs to receive from the Nation's political leadership the funds we have requested and have projected in our five-year budget run-out. If we do not, if there is significant deviation from those funding requests, I would interpret that as a change in direction from previous commitments, and then a change to our plans would indeed be warranted.

QUESTION 13:

Do you plan any review of the Exploration Architecture prior to the arrival of the next Administration to see if any changes are necessary?

ANSWER:

Given my answers above, I think it is clear that I do not see such a review as necessary.

QUESTION 14:

How do you respond to those who suggest that science, aeronautics and education are squeezed to make room for the Exploration programs? They are right, aren't they?

ANSWER:

No. The FY 2009 NASA budget request reflects the priorities and goals contained in the President's civil space exploration and aeronautics research policies, and it is also consistent with the NASA Authorization Act of 2005 (P.L. 109-155) that enacted those goals. The FY 2009 NASA budget request is 'balanced' with respect to Agency's direction and guidance from the White House and Congress. Having analyzed historical NASA budget data, I've concluded, and written elsewhere, that: "[Assuming] funding stability in constant [, inflation adjusted] dollars ..., the total [NASA funding] in every subsequent decade will match that of the Apollo development decade, 1959-1968. Expressed in a slightly different way, NASA could carry out a complete Apollo-scale effort every 15 years between the present day and the 100th anniversary of Sputnik." The percent of the NASA budget dedicated toward human spaceflight is 62 percent of the funding. Historically, this is consistent with past budget periods leaving room for science, aeronautics research, and education programs.

Vision vis-à-vis Science

QUESTION 15:

Please explain how the Vision, as it is being implemented today, advances scientific interests, security interests, and economic interests.

ANSWER:

NASA's work in carrying out the policy guidance provided in the Vision for Space Exploration advances knowledge and scientific discovery in its quest to explore new worlds and better understand our home planet. It enhances economic competitiveness by spurring innovation and technological advancement that improves our lives, and improves security by leading other nations in the peaceful pursuit of knowledge, discovery, and technical excellence through the exploration of space.

Science

The Lunar Reconnaissance Orbiter to be launched later this year is the first step in implementing the Vision for Space Exploration and will bring the nation it largest cache of new science data about the Moon since Apollo. We are closely following the NRC's "Scientific Context for Exploration of the Moon" report which notes the Moon is a well-preserved record of the solar system and provides a unique and exceptional opportunity for learning about the evolution of the Earth. The Lunar Atmosphere and Dust Environment Explorer planned for the 2011-12 time frame directly addresses an early priority of the NRC's report, as does the International Lunar Network which starts with two nodes on the lunar surface in about 2014. We continue an aggressive robotic exploration of Mars and other solar system bodies that addresses NRC decadal survey science priorities and provides the scientific foundation needed for eventual human exploration. By following through on the guidance provided in the Vision for Space Exploration, we will enable leading-edge scientific exploration for decades to come.

Economy

The global space economy exceeds more than $251B annually, growing 11 percent over the last year. NASA is a small, but integral, component of this critical global economic engine, but today space-based technologies, activities and resources impact the lives of billions of people in countless ways. These very Earthly benefits are part of what we are calling the Space Economy. We define it as "the full range of activities and resources that create and provide value and benefits to human beings in the course of exploring, understanding, and utilizing space."

In addition, NASA is creating an infrastructure for the expansion of a human presence beyond LEO, with an increased reliance upon commercial services within LEO (services like communications, logistics re-supply, and even commercial human transport to LEO). This creates an opportunity to develop a new space economy that moves space-based economics *past* LEO.

Finally, these activities employ thousands of engineers in local economies (not just in states where NASA has Centers and facilities, but across the country where engineers work on NASA's projects to return to the Moon).

Security

First, keeping a healthy cadre of engineers and scientists engaged in aerospace has added benefits to the economy as a result of the technologies they produce. Second, NASA's exciting missions can serve to inspire students to choose to enter technical and scientific fields – fields important to the nation's security. Third, NASA's leadership role in space enhances U.S. security. As more countries enter the spaceflight arena, and as more countries consider human spaceflight in particular, the exploration program allows the U.S. to provide leadership in space. Finally, leading the world in the accomplishment of awe-inspiring and magnificent feats shows that world that America is strong.

QUESTION 17:

Contrary to what is stated in the OSTP booklet, most people seem to think of the Vision as having a narrow goal of returning humans to the Moon and perhaps someday going to Mars.

In order for the Vision to be successful, how important is it for the broader context to be understood? What steps is NASA taking to ensure that the public understands what the goals of the program are?

ANSWER:

NASA is engaged in a comprehensive effort to enhance knowledge and understanding of its science, space operations, exploration and aeronautics research missions. As a part of this effort, we are carrying out a number of activities in celebration of our 50th anniversary that we hope will excite and engage millions of people around the country on NASA's past and future missions, particularly Constellation. Through print, radio, television and the Internet, NASA is utilizing every medium to ensure the public in fully informed of the Agency's mission goals and activities.

QUESTION 18:

There is concern today in the space community that, regardless of who wins the White House later this year, the Vision is quite vulnerable because people do not understand how it relates to the larger concerns of our country.

a. What is your most succinct explanation of why the taxpayers, this Congress, and the next president -- whoever it is -- should support this program?

ANSWER 18a:

As stated in the President's Vision for Space Exploration: "U.S. achievements in space have revolutionized humanity's view of the universe and have inspired Americans and people around the world. These achievements also have led to the development of technologies that have widespread applications to address problems on Earth. … Just as Mercury, Gemini, and Apollo challenged a generation of

Americans, a renewed U.S. space exploration program with a significant human component can inspire us -- and our youth -- to greater achievements on Earth and in space. ...The new technologies required for further space exploration also will improve the Nation's other space activities and may provide applications that could be used to address problems on Earth. Like the explorers of the past and the pioneers of flight in the last century, we cannot today identify all that we will gain from space exploration; we are confident, nonetheless, that the eventual return will be great.

QUESTION 18b:

There is concern today in the space community that, regardless of who wins the White House later this year, the Vision is quite vulnerable because people do not understand how it relates to the larger concerns of our country.

b. What more needs to be done to get that message out?

ANSWER:

NASA is making a vigorous effort to educate and inform the American public about the importance of its mission and how it relates to their lives, communities and well being.

BUDGET PRESENTATION

QUESTION 19:

Mr. Administrator, your budget is presented in seven new appropriations accounts, consistent with the direction by Congress in the FY 2008 Consolidated Appropriations Act. Can you discuss with the Committee the challenges you encountered in preparing your request in this way? Are you now fully prepared to execute your budget in this manner, too?

ANSWER:

The NASA budget has been updated to accommodate the new structure, and was used to develop and deliver the FY 2009 request in the new structure, as requested. We are in the process of developing the requirements and assessing the changes required to update NASA's accounting systems to accommodate execution of the FY 2009 budget request as delivered to Congress.

The new account structure parallels the existing NASA program hierarchy, plus the promotion of Education to the same level as our Mission Directorates. With the increase from two to six program accounts, NASA was concerned with the increased complexity of managing the funding of the Agency's overhead activities integrated in the full-cost program accounts. The new structure would have tripled the financial transactions required to fund these Agency-wide activities, so NASA requested funding for these activities as direct program lines within Cross-Agency Support. This had the added advantage of improving the transparency of these costs, both within the Agency and for our external stakeholders, Congress, OMB and the public.

NASA is committed to being prepared to execute the FY 2009 budget if appropriated consistent with the Agency's FY 2009 request. The changes to financial management systems and the associated business practices are complex and far-reaching and we are working through our standard system engineering processes to ensure that the system is ready to support by October 1, 2008.

QUESTION 20:

The budget also shifts overhead costs from the individual program lines and consolidates them into a consolidated cross-agency support budget line. What precipitated this change; how did you determine that it was necessary?

ANSWER:

With the increase from two to six program accounts, NASA was concerned with the increased complexity of managing the funding of the Agency's overhead activities integrated in the full-cost program accounts. The new structure would have tripled the financial transactions required to fund these Agency-wide activities, so NASA decided to request FY 2009 funding for these activities as direct program lines within Cross-Agency Support. This had the added advantage of improving the transparency of these costs both within the Agency and for our external stakeholders, Congress, OMB and the public.

QUESTION 21:

Can you assure the Committee that next year's budget will use the same accounting structure as this year (FY 2009)?

ANSWER:

NASA's current plan is to submit the FY 2010 request in the FY 2009 appropriation structure, consistent with the FY 2008 enacted appropriation.

SCIENCE

QUESTION 22:

Dr. Griffin, when adjustments are made to recognize the transfer of Deep Space and Near Earth Networks from Heliophysics to Space Operations, it appears that investments in your science mission directorate are unchanged from the FY 2008 enacted levels. Is my math accurate?

ANSWER:

NASA's Science budget grows by 1.5 percent between 2008 enacted and the 2009 request. One must account for the accounting change (full cost to direct), the transfer of the Deep Space Network and Ground Network out of the SMD budget, and the reality of the 2008 enacted level, which was $80 million lower than the budget figure stated for NASA Science in P.L. 110-161 due to the appropriations law's rescission in 2008 of unobligated prior-year balances. NASA's Science program remains consistent with the growth path laid out in the 2007 Budget.

QUESTION 23:

How did the Science Mission Directorate (SMD) manage to accelerate the Earth Science Decadal missions and quintuple funds for lunar science research without an overall budget increase in science?

ANSWER:

NASA's Science Mission Directorate developed the FY 2009 budget request with the objective of getting more science done within the available budget. Consequently, many changes were made in program content in each of our four Science themes. The Earth Science Decadal missions, along with the Lunar Science Research Program, increases in Research and Analysis, expanded efforts in the Suborbital rockets and balloons programs, and new missions (Solar Probe Plus, the Outer Planets Flagship, and the Joint Dark Energy Mission) were accommodated by the availability of funds freed across the Directorate's four themes (planetary science, astrophysics, heliophysics, and Earth science) as certain programs and projects were expected to reach the end of development or completion and also by rebalancing of resources across the themes.

QUESTION 24:

What programs suffered in order to pay for these increases?

ANSWER:

Most of the necessary funding was freed up as programs and projects were expected to reach the end of development NASA also looked carefully at its Science portfolio and made thoughtful program adjustments to accommodate the reallocations:

Planetary: Took advantage of the pre-existing Mars Scout delay from 2011 to 2013; reduced Mars mid-decade efforts to focus on a sample return mission in the 2018-2020 timeframe.

Heliophysics: Deferred Living with a Star Sentinels Missions as an achievable Solar Probe mission is the highest priority large mission in the decadal survey, and ramped down the New Millennium technology demonstration program.

Astrophysics: Reduced out year mission operations costs for the Spitzer and Chandra space telescopes, as both have completed their prime science missions.

QUESTION 25:

Why is an increase of nearly 5 times necessary for lunar science research this year and increases of another 20 percent in most years thereafter?

ANSWER:

Lunar Science Research is a new budget item starting in FY 2008, and ramps up in FY 2009 and beyond to support:

- competed research awards
- a NASA Lunar Science Institute, patterned after the Astrobiology Institute and managed by the Ames Research Center
- development of a small lunar science orbiter, the Lunar Atmosphere and Dust Environment Explorer, for launch by 2011
- development of two mini-landers, the first U.S. nodes in the International Lunar Network (ILN) of geophysical stations
- extended operations and data analysis for the Lunar Reconnaissance Orbiter, starting in FY 2010

QUESTION 26:

I have heard that there may be a new policy for containing cost growth on NASA science missions. What is this new policy and is science suffering under this policy?

ANSWER:

Please see answer to Question 28 below. Science is not suffering under our efforts to contain costs. Cost growth (not its containment) is the primary cause of reduced science output. In particular, descopes in response to cost growth are only implemented after thorough reviews of both cost savings and science impact.

QUESTION 27:

The FY 2009 budget request for the Science Mission Directorate reduces the budget for technology programs such as New Millennium (-$24.5 million) and reduces the programmatic content for planetary sciences technology development from current levels through FY 2012. What are the implications of the proposed cuts on NASA's ability to pursue several new missions and to maintain schedule and cost discipline in executing them?

ANSWER:

The New Millennium Program (NMP) has been indefinitely postponed, largely due to the relatively low past return on investment in this technology program. Of those NMP technologies successfully demonstrated to date, very few have been adopted by subsequent science missions. The reductions in Planetary Technology reflect a de-emphasis on technologies with no near-term applications, such as solar sails, while maintaining investments in advanced radioisotope power systems development, which will be required for the next Outer Planet Flagship and other future outer planet missions. There will be no schedule or cost impacts to any currently-identified missions as a result of these reductions. Generally speaking, we believe that it will be more cost effective for unidentified future missions requiring new technologies to develop those technologies as they are needed.

QUESTION 28:

Can you explain why 2/3 of the programs have exceeded the thresholds on cost and schedule, and what you are doing to address the problems in program management and cost calculation?

ANSWER:

Without making excuses, it must be recognized that the most fundamental reason why many projects overrun cost and/or schedule is that building scientific spacecraft is difficult. NASA designs and builds one-of-a-kind, first-ever systems, often with cutting-edge technologies, that must work reliably in the hostile environment of space. If it is hard to build a bridge, or remodel a kitchen, on time and within budget, then it should not surprise anyone that complex systems such as spacecraft also face such challenges.

It is also not obvious whether NASA's recent performance is worse, or better, than past history. The December 1992 GAO report, "NASA Program Costs," while strongly disputed by NASA in its details, alleged that the median cost growth on NASA programs was 77 percent.

Still, NASA's Science Mission Directorate abhors cost and schedule growth as much as the Committee does, and for the same reasons. We get no pleasure from the need to delay, descope or cancel other planned activities because of overruns. We are taking a number of new steps to address these problems, such as:

- Budgeting all new missions at the "70 percent confidence level," based on independent cost analyses at the time of confirmation review (approval to enter development).
- Requiring that Principal Investigators on competitive PI-led missions (e.g. Explorer, Discovery, New Frontiers, Mars Scout) have demonstrated experience in managing the development of space flight hardware.
- Providing more opportunities for scientists to obtain space flight hardware development experience, via enhanced suborbital payload development funding, and more flight opportunities in our sounding rocket, balloon, and research aircraft programs.
- When cost growth does threaten, insisting that descopes, and the forfeiture of award fees, be considered first, before turning to other projects for additional funds.
- Establishing new program offices at NASA Centers, with clearly defined responsibilities for effective oversight.

Specific reasons for growth in the missions identified on page Man-9 of NASA's budget request are reported regularly to Congress, in NASA's annual Operating

Plans, and in accordance with the requirements of the NASA Authorization Act of 2005 (P.L. 109-155).

QUESTION 29:

What common causes, if any, have you identified, such as faulty cost estimating, ineffective program management, or insufficient reserves to cover "unknown unknowns"?

ANSWER:

The causes of cost growth are not new, or unknown. The three causes cited in the question are certainly significant. The inherent difficulty of space flight systems development was cited in the answer to Question 28 above. The December 1992 GAO report also cited program redesign; technical complexity; budget constraints; launch vehicle delays; and inflationary effects (from schedule delays). Other causes include the failure of non-NASA partners to maintain schedule; underbids by contractors; accidental damage during development and testing; and even the vagaries of weather. Although all of these are certainly "common causes," none is common to every overrun

QUESTION 30:

What steps are you taking to remedy cost overruns generally to prevent them on future projects?

ANSWER:

Without making excuses, it must be recognized that the most fundamental reason why many projects overrun cost and/or schedule is that building scientific spacecraft is difficult. NASA designs and builds one-of-a-kind, first-ever systems, often with cutting-edge technologies, that must work reliably in the hostile environment of space. If it is hard to build a bridge, or remodel a kitchen, on time and within budget, then it should not surprise anyone that complex systems such as spacecraft also face such challenges.

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- Providing more opportunities for scientists to obtain space flight hardware development experience, via enhanced suborbital payload development funding, and more flight opportunities in our sounding rocket, balloon, and research aircraft programs.
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QUESTION 31:

What impact do the cost overruns on Glory and Mars Science Laboratory have on other projects within the Science Mission Directorate?

ANSWER:

Within a fixed total Science Mission Directorate budget, cost overruns on any project require delays or reductions in other project(s). Because there are so many projects in the SMD portfolio, it can be difficult to identify exactly which reductions "paid for" a particular overrun. For example, in a portfolio of only four projects, assume projects A and B overran at the same time, and projects C and D were reduced to pay for them. There would be an infinite number of valid answers to the question, "where did the money to pay for the project A overrun come from?"

NASA continues to assess the trades that will need to be made to compensate for the Glory and MSL overruns and will inform the Congress of the expected impacts when appropriate.

QUESTION 32:

Dr. Administrator, you are planning to build a lunar outpost and you are looking at how the return of humans to the Moon may enable certain scientific investigations to take place. How do you respond to concerns that the lunar outpost will follow the pattern of the Space Station – that is, science is used for justification to build it, but when cost overruns almost inevitably happen, science pays, and at the end of the day, very little of the underlying scientific research that underpinned the project is achieved?

ANSWER:

In 2006, NASA established the Global Exploration Synthesis team to identify primary themes and objectives for lunar exploration. These objectives were grouped into six themes: 1) human civilization; 2) scientific knowledge; 3) exploration preparation; 4) global partnerships; 5) economic expansion; and, 6) public outreach. These themes and objectives serve as the foundation for the development of the lunar architecture requirements and architecture to ensure the capability for science and exploration is built into the design and concept of operations.

NASA is engaging the science community to identify high-priority Lunar science and is crafting an architecture that allows exploration and science opportunities starting with the first mission rather than waiting until the lunar infrastructure is in place before performing science and exploration. One of the Science Mission Directorate's high-priority "guiding principles" is to ensure that the U.S. Space Exploration Policy succeeds, and toward that end, is growing a robust Lunar Science program with reference to recommendations from the National Research Council's study, "The Scientific Context for Exploration of the Moon." This program includes growing a healthy lunar science research community e.g., new research and data analysis program elements, the National Lunar Science Institute, a new annual Lunar Science Conference and initiating a series of lunar science missions to help prepare for, and complement, data gathered during human missions. For example, the Lunar Reconnaissance Orbiter (LRO) will transfer to the Science Mission Directorate after prime Exploration Systems Mission Directorate LRO mission operations and data gathering are complete; the Lunar Atmosphere and Dust Environment Explorer mission (LADEE) will help understand the Lunar atmosphere for human exploration; and, the first two nodes of the International Lunar Network will be put in place with planned small lunar landers. These activities show the synergy between the Exploration Systems and Science Mission Directorates to ensure the architecture will support science objectives starting with the first human missions to the Moon. These activities are supported in the Administrations FY2009 budget request.

Earth science

QUESTION 33:

For earth science, there are modest increases in the budget for FY 2009 over last year's levels, yet those levels remain roughly flat through 2010. They then drop off in 2011 through 2013. These levels are well below the levels recommended by the National Research Council Decadal Review. How do you justify these disparities?

ANSWER:

National Research Council Decadal Survey reports traditionally provide recommendations beyond current Agency outyear budget projections that identify for the Legislative and Executive branches opportunities for additional investment. The Executive branch responded to the NRC's Earth science Decadal Survey in the President's FY 2009 request by investing $103M in FY 2009 and a total of $910M over five years. These totals represent a combination of targeting existing out-year future mission resources and transfer of funds from other NASA science areas. This will enable the start of development of the first two recommended Decadal Survey missions—the Soil Moisture Active/Passive mission and the ICESat-II mission. Decadal surveys look out 10 or more years into the future, and thus require several budget cycles to implement, even in part. With the FY 2009 budget request, NASA is taking the right first steps.

QUESTION 34:

Which specific missions recommended by the decadal review are omitted from your budget? How much additional funding would be required to include them?

ANSWER:

The NRC Earth Science Decadal Survey recommended 14 missions for NASA to implement, one for NASA and NOAA to implement together, and two for NOAA to implement alone. These missions were not intended to be started all at once, but were collected into three time phases for implementation.

In FY 2008, we initiated accelerated pre-formulation activities on two of the recommended missions from the first tier of missions, SMAP and ICESat-II, and started advanced study activities on the other two missions in that tier, CLARREO and DESDynI. We also funded advanced study teams for all five missions in the second phase or tier of missions, which includes SWOT, HyspIRI, ASCENDS, ACE, and GEO-CAPE.

For all of these activities, to varying degrees, the pace of development is determined by the available funds, the maturity of the missions' science requirements, and the technology requirements to achieve the mission science. We defined the current mission development program to match the funding provided, and with additional funds we would accelerate all elements of the program at different rates.

The Decadal Survey recommended the first four missions for launch between 2010 and 2013. The current funding supports the launch of SMAP as early as 2012 and ICESat-II in 2015. Although current funding does not support the overall timeline recommended by the Decadal Survey for mission implementation, NASA is using the recommended list as the principal determinant of the priority of NASA's Earth Science satellite missions beyond those currently in development.

QUESTION 35:

I understand that you are prioritizing the list of missions recommended by the decadal review. When will that list of missions be complete?

ANSWER:

The National Research Council 2007 Decadal Survey, the first such survey for NASA Earth Science, recommended 15 missions for NASA to launch during 2010-2020. The Decadal Survey mission priorities are the principal determinant of the priority of NASA's Earth Science satellite missions beyond those currently in development. The missions were grouped into three tiers: near-term, 2010-2013; medium-term, 2013-2016; and far-term, 2016-2020. The NRC Decadal Survey did not prioritize missions within each tier. NASA is not performing independent rankings for the missions that would change the basic tier priorities assigned by the Decadal Survey.

QUESTION 36:

Dr. Griffin, please describe the steps NASA is taking to achieve cost estimates for the new earth science missions NASA plans to initiate in FYs 2008 and 2009.

ANSWER:

During the earliest mission pre-formulation activities, NASA is devoting its science and engineering expertise to defining the mission requirements and assessing the technical and programmatic possibilities to achieve those requirements. The mission concepts contained in the Decadal Survey were presented at a very high level; with none of the details necessary to conduct a realistic cost estimates. In FY 2008 and FY 2009, NASA is developing mission requirements for each of the four first tier missions, SMAP, ICESat II, DESDynl and CLARREO. We will follow with preliminary mission concepts that include specific instrument implementation approaches, suggested approaches for acquisition of primary mission elements, and overall mission architecture. Once these data have been assembled for a mission, the mission concept study team, with guidance from NASA headquarters, will conduct a detailed grass roots cost estimate using NASA Center pricing guidelines. In parallel, at least one independent cost estimate will be completed to compare with the grass roots cost estimate.

QUESTION 37:

You have initiated two new missions in FY 2008 -- the Soil Moisture Active/Passive (SMAP) mission and the Ice, Clouds and Land Elevation Satellite II (ICESAT-II) mission. What are the cost estimates of these two missions, in particular?

ANSWER:

These two missions are still in the requirements development process described above, and do not yet have a detailed cost estimate for completion. NASA conducted some preliminary cost estimates in 2006 and 2007 that we used to develop preliminary budgets for these two missions. Those estimates are not substitutes for the more accurate budgets to come about as a result of the detailed requirements analysis and mission concept development. The actual estimates from these earlier mission concept studies were approximately $390M for SMAP and $610M for ICESat II, expressed in fixed year FY 2007$.

QUESTION 38:

When do you plan to announce the next three missions -- by the end of the calendar year?

ANSWER:

The FY 2009 budget request for the out years (FY 2010-2013) contains sufficient funds to initiate the other two missions in the first block of missions recommended by the NRC decadal survey in the period 2011-2013. These are the Deformation, Ecosystem Structure and Dynamics of Ice (DESDynI) and Climate Absolute Radiance and Refractivity Observatory (CLARREO) missions. What is undecided at this time is which of them will proceed first; that decision will likely be made in the fall of 2009 based on the results of technical studies now underway. Along with SMAP and ICESat-II, these will accomplish the first block of four Decadal Survey-recommended missions. A fifth mission, the first of the small Venture-class missions also recommended by the NRC Decadal Survey, may also be started in this time frame, though the design and implementation of this new mission class is still being defined.

QUESTION 39:

What factors contribute to determining accurate cost estimates for the missions you plan to undertake in FYs 2008 and 2009?

ANSWER:

The primary factors that determine the accuracy of the cost estimates are: (1) the completeness of the requirements definition for the mission; (2) the precision with which we know the development schedule for the mission; and, (3) the accuracy with which we know the instrument technology required to accomplish the mission. During the pre-formulation activities in FY 2008 and FY 2009, we will refine each of these mission parameters.

QUESTION 40:

What is the basis of the cost estimates for missions in development and new missions that are planned to start in FY 2009?

ANSWER:

For OCO, OSTM, Glory, Aquarius, NPP, LDCM and GPM, the estimates are based on Level-1 requirements at various stages of maturity. For Decadal Survey missions, the cost estimates will be based on: (1) an initial mission requirements statement; (2) instrument and mission technology implementation assessment; and, (3) an end-to-end mission development schedule, including subsystem schedules for any developmental technologies. We are assembling experienced science definition teams for each Decadal Survey mission and chartering each to define clearly the mission science objectives and the prioritized mission science requirements. The teams are then giving these requirements documents to engineering development teams to define initial mission concepts and implementation approaches for the individual missions. The outcome will be a summary of the measurement and mission technology requirements, an assessment of the industry and NASA technology capabilities to meet or (if needed) to develop these requirements. Together the study teams will develop a mission development schedule and an associated mission cost. In addition, we will conduct independent cost and schedule analyses by third party organizations such as Aerospace, SAIC, or NASA's own IPAO for comparison purposes.

QUESTION 41:

Generally speaking, the instruments that we have in space are aging and as you know it takes time to develop new ones. Given this budget, how will this country be equipped with the right instruments necessary to answer the science questions regarding climate change in the future?

ANSWER:

Eleven of the 14 satellites in the present fleet of NASA Earth observing research missions are in extended mission phases, beyond their design lives. However, all of these missions were examined in detail for continuation by the 2007 Earth Science Senior Review and all were certified for extension through FY 2009. With the exception of ACRIMSAT, all of these missions were deemed sufficiently capable to continue operation through at least FY 2011. Seven additional NASA research missions are in development for launch between June 2008 and June 2013; of these, some (such as the Ocean Surface Topography Mission/JASON-2, to be launched in June 2008, the NPOESS Preparatory Project to be launched in June 2010, and Landsat Data Continuity Mission to be launched in July 2011) continue key climate time series begun with earlier missions (such as TOPEX/Poseidon and JASON-1 for sea level height, Terra and Aqua for MODIS/VIIRS global, 250m-1km multispectral imaging, and Landsat-5/Landsat-7 for 30-m resolution multispectral land imaging). Others initiate new climate measurements (such as the Orbiting Carbon Observatory (atmospheric carbon dioxide concentrations) to be launched in December 2008; Glory (aerosol distributions and scattering properties, as well as continuation of total solar irradiance measurements) to be launched in June 2009; Aquarius (sea-surface salinity) to be launched in May 2010; and the Global Precipitation Mission (4-hourly global rain measurements) to be launched in 2013 and 2014. The enacted FY 2008 budget and the President's FY 2009 budget request includes funding for the new Soil Moisture Active/Passive and the ICESat-II missions with significant initial work performed in FY 2008; the budget request also includes out-year funding for two other high priority missions recommended by the Decadal Survey (with mission choices to be made in 2010-2013 timeframe).

The Earth Science Division is working actively to engage partners, both with other U.S. agencies and internationally, wherever it is advantageous and feasible to enhance the scope of the Earth Science flight and research activities.

NASA is also working closely with NOAA to ensure that key climate time series are obtained in the NPOESS period. The OMPS-Limb and CERES instruments have been manifested onto the NPOESS Preparatory Project mission to ensure acquisition of high-quality ozone profile and Earth radiation budget measurements during the lifetime of the NPP.

National Polar-Orbiting Operational Environmental Satellite System (NPOESS) and the NPOESS Preparatory Project (NPP)

QUESTION 42:

The FY 2008 conference agreement included additional funds to restore two high-priority sensors impacted by the NPOESS restructuring decision. How much have both you and NOAA allocated in FYs 2008 and 2OO9 to restore these important sensors?

ANSWER:

NOAA continues to have funding responsibility for the NPOESS de-manifested climate sensors. In FY 2008, NASA advanced $9.5M in FY 2008 funds to initiate schedule-critical development of the CERES FM5 instrument for flight on the NPOESS Preparatory Project. In FY 2009, NOAA intends to pay back these funds to NASA. (In addition to CERES FM-5 on NPP, NASA and NOAA previously have co-funded the implementation of the OMPS-Limb instrument for flight on NPP.)

NASA has provided $850K of FY 2008 funding for the initialization of the Total and Spectral Irradiance Sensor (TSIS) instrument suite. This instrument is planned for flight on the NPOESS C1 spacecraft, with a scheduled launch date of January 2013.

The Administration has requested $74M for NOAA in FY 2009 to restore CERES and TSIS and develop NOAA's capacity to process climate data records.

QUESTION 43:

Where are the NPOESS and the NPOESS Preparatory Project (NPP) in terms of their acquisition life cycles? How much has NASA spent to date on NPP?

ANSWER:

The NPOESS Preparatory Project (NPP) is in the Implementation Phase of its acquisition life cycle. The systems and subsystems are in the final stages of assembly, integration, and test prior to launch. The NPP spacecraft and ATMS sensor are complete. The project is waiting for the remaining sensors to be delivered from the NPOESS Integrated Program Office. NASA has spent $614.1M in full-cost accounting for NPP during FY 1999 to FY 2008.

NASA is not involved in the implementation of NPOESS, which is co-funded by NOAA and DoD.

QUESTION 44:

Please summarize the challenges facing the NPP program as it moves forward. In your answer, can you please discuss the delivery of the visible infrared imaging radiometer suite (VIIRS) instrument and how the timing of that delivery is affecting the schedule and cost of NPP?

ANSWER:

The delivery of the Visible Infrared Imaging Radiometer Suite (VIIRS) is the single biggest challenge remaining on NPP. The technical and management challenges on VIIRS have been significant. However, with the revised schedule and a planned delivery of VIIRS in April 2009, we believe the VIIRS test flow has the correct activities and schedule to properly integrate and test the sensor for launch in June 2010. The previously scheduled launch date was September 2009. The additional cost to NASA associated with an 8-month delay is an average of $2.75M per month, or a total of $22M. The additional amount covers costs for the technical support workforce and infrastructure required to maintain instruments, equipment and facilities for 8 months to be available at launch. The delivery of VIIRS is on the critical path to launch for NPP so any slip in the VIIRS delivery translates into a day-for-day slip in the launch of NPP.

The government is currently holding 60 days of schedule margin on the delivery of VIIRS, which is scheduled to be delivered in April 2009.

QUESTION 45:

With respect to NPP, the budget includes a significant spike in funds requested for FY 2010, which is more than double what was planned for that same fiscal year in the FY 2008 budget. (Specifically, $46.3M in FY 2010 was requested this year as compared to $20.2M for FY 2010 last year.) What are the reasons for this change?

ANSWER:

The FY 2008 budget supported a planned NPP launch in September, 2009. Therefore in the FY 2008 budget request, FY 2010 costs covered only the initial checkout of the NPP spacecraft and instruments prior to the handover of NPP to NOAA for further operations, and NASA NPP-related science and limited (OMPS-Limb) processing activities. However, the delivery of the VIIRS instrument by the NPOESS Integrated Program Office to NPP has been delayed and will now take place in April 2009, resulting in an NPP launch slip to June 2010 (the NPP launch slip was agreed to in January 2008 by the NPOESS EXCOM). The FY 2009 NASA budget request thus covers NPP costs for final VIIRS integration and test, final satellite prelaunch preparations, and launch, in addition to initial post-launch checkout in FY 2010.

QUESTION 46:

I understand that NASA has yet to manifest the Total Solar Irradiance Sensor (TSIS) to a satellite platform; however, an announcement is expected this month. Can share with the Committee any additional information on the manifesting of TSIS?

ANSWER:

The tri-agency NPOESS Executive Committee (EXCOM), on May 1, 2008, concurred in the NPOESS Integrated Program Office (IPO) recommendation that the TSIS instrument suite be manifested on the NPOESS C1 spacecraft, scheduled for launch in January 2013.

QUESTION 47:

Will the increases requested in the FY 2009 budget proposal be sufficient to avoid any critical gaps in the continuity of important Earth observations? If so, which are the most important observational records that remain at risk?

ANSWER

The critical climate measurements at risk following the NPOESS Nunn-McCurdy-driven reprogramming of the NPOESS program included the Total and Spectral Irradiance Sensor (TSIS), the Clouds and Earth's Radiant Energy System (CERES), the Aerosol Polarimetry Sensor (APS), the Ozone Mapping and Profiler Suite (OMPS), and the Ocean Altimeter (ALT). The increases requested in the FY 2009 budget proposal are sufficient to avoid most critical gaps in the continuity of important Earth observations. In particular, the requested funds will enable NASA to launch and operate the Ocean Surface Topography Mission (OSTM) for measuring ocean altimetry from 2008 to ~2013 and the Glory mission carrying APS and part of a TSIS instrument from 2010 to ~2013. NASA is also working closely with NOAA to restore climate sensors; the Administration's FY 2009 request for NOAA and NASA provides funds for flying CERES (FM5) and OMPS on the NPP satellite (launch in 2010, operation through ~2014) and TSIS and CERES(FM6) on the NPOESS C1 spacecraft (launch in 2013, operation through ~2018). The most important remaining risk is in the provision of ocean altimetry measurements beyond 2013. NASA and NOAA (and the U.S. Navy) are actively working together to pursue possible approaches for continuing this key observational record.

Glory

QUESTION 48:

What is causing the cost growth and delay on Glory; is it only the main instrument, the Aerosol Polarimetry Sensor?

ANSWER:

The Glory cost growth and schedule delay are due to poor management execution by the Aerosol Polarimetry Sensor (APS) instrument contractor, Raytheon Space and Airborne Systems, El Segundo, CA. All of the schedule delay and approximately 80 percent of the cost growth are due to the poor performance of the APS instrument contractor. A minor part of the cost growth is due to the spacecraft contract with

Orbital Sciences, Dulles, Virginia. The growth due to the spacecraft development would have been readily covered by the Glory Project reserves.

QUESTION 49:

Will Glory still be able to meet its planned 2009 launch date? How will these problems affect the planned launch date?

ANSWER:

The Glory mission has been approved for a June 2009 Launch Readiness Date (LRD), a three-month slip from the previous March 2009 LRD. This new LRD will accommodate APS instrument delivery delays and includes a thorough assessment of the remaining APS development challenges. This new NASA developed and approved plan does not rely on the APS contractor's assessments of its own performance; rather, it relies on NASA's own technical and programmatic assessment of the APS completion requirements and the contractor's capabilities.

QUESTION 50:

Some have suggested that "there very likely" is a common thread between Raytheon's problems with the sensor for Glory and difficulties with the Visible Infrared Imager Radiometer Suite (VIIRS) that has delayed NPOESS. Is there such a link? What are Raytheon's recurring problems with delivery of these systems?

ANSWER:

The contractor's challenges common to both the Glory APS and NPOESS/NPP VIIRS programs include poor planning and management execution combined with the contractor's own burdensome institutional processes. The contractor's decisions to move both programs to a new facility midway through development also have contributed to the challenges of delivering these systems within cost and schedule. Technical challenges have additionally hampered the VIIRS development, but not the APS instrument development.

QUESTION 51:

Don't these concurrent delays call into question the productivity of the contractor?

ANSWER:

Various cost and schedule performance metrics including, but not limited to, earned value measurement (EVM) methods bear out the assertion that contractor productivity has been extremely poor on both the NPOESS/NPP VIIRS and Glory APS contracts.

Research and Analysis (R&A)

QUESTION 52:

What will NASA's priorities for the overall proposed increase for Earth Science R&A?

ANSWER:

The major increase in Earth Science within President's FY 2009 budget request is focused on the revitalization of the flight portfolio through the acceleration of mission recommendations of the Decadal Survey. Science teams for each mission will be solicited competitively through Research Opportunities in Space and Earth Science (ROSES) amendments as the missions move formally into formulation; ROSES 2008 amendments are being expedited for the SMAP and ICESAT-II science teams, funded through the mission initiative line. The modest proposed increase in Earth Science R&A for FY 2009 will be focused on several areas from the ROSES 2008 omnibus solicitation, including the first focused ROSES element soliciting research on biodiversity (terrestrial, marine, aquatic), the creation of an ocean salinity science team to help prepare the research community for the availability of Aquarius data following its launch in 2010, and the initiation of a focused research-based effort on the use of space-based remote sensing for studies of water quality. The ROSES 2008 solicitation also includes the solicitation for a focused element on dynamical ice sheet modeling as part of an ongoing Earth System modeling call. The detailed plans for the R&A increase in FY 2010 will be developed during the coming 18 months, based on research progress being made by presently funded researchers, the success of upcoming launches and field campaigns, and the overall rapid evolution of the Earth System Science field. It is anticipated that much of the FY 2010 increase will be directed towards those programs involved in extensive field work in the 2010 and 2011 time frames; such work not only supports basic process studies in Earth System modeling, but contributes vitally to the validation of data from NASA satellites, especially those launched most recently (in 2010/2011, this would include OSTM and OCO in 2008 and Aquarius and NPP in 2010).

QUESTION 53:

Why does the Administration propose a 25 percent cut for the applied sciences component of Earth Research? How is this proposal consistent with the emphasis of recent years and those recommendations of the Decadal Survey to improve the usefulness of data, especially in serving decision-makers?

ANSWER:

The Applied Sciences direct budget for FY 2007-2009 is as follows:

- FY 2007: $33,897,000

- FY 2008: $33,003,000 +12,425,000 additional funding based on FY 2008 appropriation + $500 thousand additional funding from Earth APA– $9,487,501 rescission of prior-year balances imposed in 2008 = $ 36,440,499 total

- FY 2009 Request: $33,839,000

The FY 2009 request is $836K more than the FY 2008 request. The apparent decrease results from additional funding that was provided by Congress in the FY 2008 enacted budget.

The Earth Science Division welcomes the Decadal Survey recommendation to plan our missions with both science and societal needs in mind. Indeed, Applications Program staff now serve on the Mission science planning teams and plans are being developed for specific Applied Science support for applications studies for appropriate missions.

QUESTION 54:

How much funding for R&A is included in the FY 2009 budget across all divisions and how does this level compare to the FY 2008 enacted level?

ANSWER 54:

NASA's initial FY 2008 Operating Plan has increased funding for R&A, even above the levels enacted by Congress in the FY 2008 Appropriation. The FY 2009 Budget Request includes further increases. The attached table (in $M) provides comparisons for R&A and similarly competed research projects.

PY07 Op Plan	PY08 Enacted	PY08 Op Plan	FY09 Budget	
32.5	30.9	33.1	33.9	Heliophysics R&A
52.2	50.3	56.6	61.4	Astrophysics R&A
111.7	123.6	141.7	142.4	Planetary R&A
11.9	10.0	15.7	18.8	Discovery Research
			8.1	Outer Planets Research
14.2	27.4	23.3	24.9	Mars R&A
135.9	141.9	133.9	136.9	Earth R&A
53.9	61.2	62.4	62.3	EOS Science
5.0	4.9	11.3	14.4	Space Laser Ranging
417.2	450.2	478.0	503.2	Total

QUESTION 55:

At this level, how does NASA ensure that all data generated are analyzed and that NASA gets more value from its flight missions?

ANSWER:

Each of NASA's missions is accomplished by small, dedicated science teams that are involved in spacecraft operations and instrument calibration, in addition to data analysis. Increased science return on investment is achieved by rapidly archiving all instrument data which is made accessible to the entire science community. Access to the data and funding are provided to the science community for data analysis through a competitive peer review process. The competitively selected R&A calls ensure that NASA funds the highest quality research.

QUESTION 56:

In FY 2009, does NASA expect to change the blend of in-house versus grants for its R&A activities across all the science themes?

ANSWER:

The percentage of in-house versus university grants depends purely on funding the top rated proposals, regardless of the submitting institution. The process of peer review and selection will remain the same in FY 2009 as in previous years; therefore, NASA expects the number of selected in-house versus grants for its R&A activity to follow the panel review process in FY 2009 as well.

QUESTION 57:

The FY 2008 Consolidated Appropriations Act directed NASA to enter into an agreement with the National Research Council to assess NASA's R&A activities. What is the status of that agreement and when do you expect the report to be completed?

ANSWER:

NASA is currently initiating all the studies directed in the subject legislative report. Negotiations with the NRC on the detailed scope of the R&A study have been concluded and a formal request for the activity has been conveyed to the NRC. Once a proposal is received we expect to fund it promptly. We expect to receive findings and recommendations by December 2009.

Special Assistant for R&A

QUESTION 58:

What are the functions of that position [Special Assistant for R&A]?

ANSWER 58:

The position of Senior Advisor for Research and Analysis, Science Mission Directorate, provides scientific leadership, strategic direction, and executive program management for all elements of the Science Mission Directorate Research and Data

Analysis portfolio. This includes evaluation of the overall program health and balance of Research and Analysis (R&A) within Divisions, improvement in communication between the Science Mission Directorate and the science community, discovery and repair of process inefficiencies to maximize the science return on NASA's investment in scientific research, and the maintenance of high personal scientific standing in the international scientific community to insure credibility of the Science Mission Directorate's R&A efforts.

QUESTION 59:

Has the scientific community responded favorably to actions that are being taken by the Special Assistant for R&A?

ANSWER:

Major science advisory and evaluation groups have invited the Senior Advisor for Research & Analysis (R&A) to speak to them over the course of the past year, and all have reacted strongly in favor of the work she is performing. These include: the NAC Science subcommittees in the various disciplines; the Astronomy and Astrophysics Advisory Committee; the Committee on Astronomy and Astrophysics; the NRC Space Studies Board; and the Committee for Lunar and Planetary Exploration. R&A presentations have been made at town hall meetings at every major scientific conference over the past year, and these have been widely attended and warmly received. The noticeable positive change in the interaction between the Science Mission Directorate and the community has been perceived across all four disciplines.

QUESTION 60:

How were decisions made about how much R&A funding should be requested for each of the SMD divisions?

ANSWER:

Twice a year the Senior Advisor for R&A holds a major level review of the R&A programs by Division. The Division Directors present their programs to SARA and the Associate Administrator, and demonstrate their progress towards reducing the time it takes to make selections, the average award sizes and length of time per grant, and the balance of funding in research areas across each Division. As a result of these reviews, the Division Directors modify the funding levels within program elements within their Divisions to reach the metrics established by the Associate Administrator through the SARA position.

Applied Sciences

QUESTION 61:

Dr. Griffin, in addition to the research priorities for the five new earth science missions to be initiated in the FY 2009 request, the earth science decadal survey emphasized the application of these data for societal benefits. Does NASA plan to make changes in the applied sciences program to support the application of data from these new missions for societal benefits?

ANSWER:

NASA has already made changes to its Applied Sciences Program in response to the Decadal Survey. Previously, NASA Applied Sciences activities focused on missions already in flight and producing validated measurements. Following the spirit of the Decadal Survey recommendations, all of the Decadal Survey mission science planning teams now has Applied Science staff as members from the start. We have also changed our solicitations (ROSES 2008) to encourage exploratory Applied Sciences proposals in advance of mission launches.

QUESTION 62:

What changes do you anticipate making in your applied sciences programs to help state, local, private and Federal bodies adapt to and mitigate the impacts of climate change discussed in the International Panel on Climate Change (IPCC) assessments?

ANSWER:

NASA's Applied Sciences program has created a new application area on climate change and has, in its ROSES 2008 solicitation, called for proposals in this area. The Climate application area focuses on Earth science applications to support policy approaches and decisions the nation will consider in responding to climate change (e.g., policy frameworks, technology approaches, market approaches, etc.), particularly decision-making on climate mitigation and adaptation and possible impacts of the policy, technology, and other approaches.

The most recent IPCC Working Group II report concludes that *impacts are occurring now as a result of climate change.* Many of these impacts are well known—increased severity of drought, weather events, fires, changes in natural resource availability and in vulnerability to a number of hazards such as vector borne diseases and invasive species, to name a few. A major way that Applied Sciences is and will continue to contribute is through strengthening of existing decision support systems, such as fire management, infectious disease tracking, and water management. Tactical and strategic responses to the recent wildfires in California were supported extensively by NASA measurements and data products – developed by NASA Applied Sciences Program – obtained from the Ikhana Unmanned Aerial System (UAS).

QUESTION 63:

Are the potential applications of data from the proposed new missions being considered in the planning of these missions?

ANSWER:

Yes, all of the Decadal Survey mission science planning teams now have Applied Science staff as members. We have also changed our Applied Sciences solicitations (ROSES 2008—sections A-18 and A-19) to encourage proposals for upcoming missions.

QUESTION 64:

Why does the budget propose to return to the levels allocated for applied sciences in FY 2007 and not sustain the increases of $15 million provided in the FY 2008 budget?

ANSWER:

The President's FY 2009 budget request for the Applied Sciences Program is increased relative to the FY 2008 President's request. The larger sum appropriated in FY 2008 was due to a Congressional augmentation, which the Agency could not predict. The FY 2009 request funds the base program slightly above the recent historical level.

Mars Exploration

QUESTION 65:

What accounts for such a large decrease in the Mars Exploration program?

ANSWER:

The reduction is largely from the unfortunate slip of the Scout mission from the 2011 launch opportunity to the 2013 opportunity. This slip was a result of a procurement-related conflict of interest created by one of the two proposers in the submitted Concept Study Reports, which violated a clause in the Announcement of Opportunity. This violation necessitated disbanding of the Evaluation Panels and reconstitution with new members. The delay in final selection resulting from this reconstitution eroded schedule margins for the missions, adding unacceptable risk in making the 2011 launch opportunity. In addition, reductions occurred in the Mars technology budget, deletion of funds for the mission previously scheduled in 2013 mission (the Mars Science Orbiter), and a reduction in the early funding for the 2016 mission that was being defined by the Program in conjunction with the Mars scientific community. These reductions were among the tough trades NASA made to reallocate resources to an outer planets flagship mission and new Earth sciences missions that ranked highly in their respective decadal surveys.

QUESTION 66:

NASA has been trumpeting its plan for a Mars sample return by 2020, while its budget reduces funds for Mars Exploration between FYs 09 and 12 by over $900 million. Can you explain to the Committee this apparent inconsistency?

ANSWER:

The FY 2009 budget was developed in parallel with initial Mars Sample Return (MSR) planning. The Mars budget reductions were among the tough trades NASA made to reallocate resources to an outer planets flagship mission and new Earth sciences missions that ranked highly in their respective decadal surveys.

During 2008, NASA is reviewing the development plans, including schedule and budget, for MSR. We are working both within NASA and with our international partners to define the architecture and partnerships. Based on the outcome of these studies, NASA make adjustments to its budget and programmatic plans to ensure they are commensurate.

QUESTION 67:

What is being removed from the program and how were these reductions determined?

ANSWER:

Very few things were entirely removed from the Program. The 2013 Mars Science Orbiter was removed since the 2011 Scout mission, also an orbiter, slipped into this launch opportunity; the 2018 Scout mission and budget was removed; and approximately half of the 2016 mission's budget was removed. The reductions were determined by prioritization of missions and activities within the Science Mission Directorate in response to recent National Academy of Science reports and Decadal Surveys, including an expanded Earth science mission portfolio and an Outer Planets flagship mission to a destination such as Europa or Titan. Required funding level for these needs determined the reductions to the Mars Program budget.

QUESTION 68:

Is NASA planning to engage the scientific community on its plans to focus on a Mars Sample Return mission, and if so, how? When?

ANSWER:

The plans for MSR are based on community input from the National Academy of Sciences Decadal Survey and Astrobiology Strategy for the Exploration of Mars. Both of these documents strongly endorse MSR as the next step for Mars exploration. In the past year, NASA sponsored a Next Decade Science Analysis Group to assess the scientific value of and requirements for the sample to be returned. In addition, the international science community has been engaged through a sample-return-focused task force of the International Mars Exploration Working Group.

QUESTION 69:

The February 29, 2008 issue of *Science* magazine has the headline: "*War of the Worlds*", and comments that "...some researchers worry that the golden age of Mars science may be on the wane as NASA shifts its focus to Earth and Jupiter or Saturn."

Are you backing away from a robust robotic Mars exploration program? If so, why, when the Mars program has been such a successful strategy both in terms of science return and public engagement?

ANSWER:

Mars exploration is a central part of the Vision for Space Exploration. The Mars Exploration Program has been very successful in developing a robust series of interrelated missions that permit an intensive and synergistic study of Mars. With the recent NRC report *Astrobiology Strategy for the Exploration of Mar*s, it has become clear that the highest science priority of Mars exploration should be Mars Sample Return, as part of a robust robotic exploration program. How this complicated mission would be accomplished, in conjunction with other complementary missions, has been the subject of focused studies by the Mars community in the past year (Next Decade SAG & Mars Strategic Science SAG). The reports are now under consideration within NASA along with international partners through IMARS. The nature and number of missions through the next decade depend on the estimated costs and launch sequence for the Mars Sample Return elements, the degree of international collaboration, and of course the Mars Exploration Program's budget and budget profile. There are a number of scientifically exciting missions that the Mars community has identified that would also be complementary and/or supportive of a sample return mission. The other missions that can be flown will depend on these mission's objectives and costs, as well as the Program's overall budgetary capacity.

Mars Sample Return Mission

QUESTION 70:

What is your current cost estimate?

ANSWER:

A Mars Sample Return mission will cost on the order of $5B. Of that, NASA is currently planning to invest $3.5B, with the hope that international partners will contribute the remainder. NASA believes this initial estimate is more accurate than previous estimates, the most recent of which was from the 2002-2003 studies, due to our significantly expanded knowledge of Mars mission systems and costs as a result of Mars Exploration Rovers, Mars Reconnaissance Orbiter, and now the Mars Science Laboratory.

QUESTION 71:

In which fiscal years do you anticipate requesting funds?

ANSWER:

The bio-safety facility that will receive the returned samples is the longest lead-time element of a Mars sample return mission. Currently Planetary Protection requirements show that this facility will need to be on-line and certified for use prior to the samples leaving Mars' orbit. Under those circumstances, initial technology development funding must begin in FY 2010.

QUESTION 72:

When do you anticipate launch?

ANSWER:

NASA's current plans are to launch the landed element to acquire the samples in 2018 and the orbiter to return them to Earth in 2020. The final dates will be determined as mission costs are refined and Program budgets are finalized. This coincides well with the plans of the European Space Agency's (ESA) Aurora Program, which is also planning for MSR in the 2020 timeframe. NASA is working closely with ESA and other international partners to ensure schedules remain compatible.

QUESTION 73:

When would the sample be returned to Earth?

ANSWER:

For an MSR with the landed element launched in 2018 and the return orbiter launched in 2020, the samples would return to Earth in 2023.

QUESTION 74:

If you make Mars Sample Return a priority for the next decade of the Mars program, what other parts of the Mars program, if any, will have to be sacrificed in order to pay for it?

ANSWER:

The impact to other missions in the Mars Exploration Program's mission portfolio in the next decade will depend on the Program's total budget and phasing, and the final launch dates of the Mars Sample Return mission. An additional factor is the final agreements with international partner's role in the mission, and the resulting reductions in NASA budgetary requirements. There will be 1-2 years of rather high peak costs for Mars Sample Return mission, especially for the landed element.

Therefore it is a possibility that the Mars Exploration Program budget may not be able to support a mission in the launch opportunity immediately prior to the landed element's launch. This possibility has been successfully vetted with the Mars community over the past 1-2 years, through the Mars Exploration Program Analysis Group (MEPAG) and several special studies. However, the Mars scientific community does not believe that a Mars Sample Return mission "at all costs" is appropriate, and deletion of multiple Mars missions, and loss of the Mars Program's interconnected mission set that has produced remarkable science over the current decade, is not acceptable. The science community will be chartered to develop next-decade architecture recommendations after MSR, that continue to address the other science goals of the program and solar system exploration defined by National Academy's reports.

QUESTION 75:

What are your plans for a quarantine facility for returned Mars samples? Are those costs included in your cost estimate for the mission? How much is it?

ANSWER:

At present, NASA and the international community are planning for the sample to be returned to the United States. The site selection process is expected to begin in late FY 2010 and be completed in 2012. NASA's Planetary Protection and curation experts are working with their international counterparts to establish the requirements and schedule for the facility. The planetary protection and sample-receiving facility costs are included in the overall MSR cost estimates. The preliminary estimates for facility cost indicate that it will be on the order of $300M.

Human exploration of Mars

QUESTION 76:

What has been the impact of the limitation contained in the FY 2008 conference agreement against expenditures specifically in support of human exploration of Mars?

ANSWER:

NASA will abide by congressional direction and will not fund any research, development or demonstration activities related exclusively to the human exploration of Mars. However, such language has had a direct effect on NASA's exploration projects and programs. For example, in FY 2007, NASA funded a Mars design reference mission study to reach some basic architectural decisions, estimate an approximate date for a human mission to Mars, and define the connections to the lunar missions currently in development. Most of that effort was accomplished. As a result of the FY 2008 limitation, NASA limited the study's scope to finish the basic work and reach some preliminary decisions using FY 2007 funds.

While it is true that NASA's current focus is on sending humans to the Moon, it is also true that an extended ban on research, development and demonstration activities related exclusively to the human exploration of Mars in the near term could hinder future human Mars missions. A large endeavor such as the Mars mission requires significant advanced planning. New technologies required for a human Mars mission will need to be identified. Continued research and analysis is required during the next years to understand technology gaps and start long-term technology development. Therefore, NASA considers it to be a less efficient use of taxpayers' dollars to focus solely on near-term missions without taking into consideration how longer-term missions, such as those to Mars, will be impacted.

QUESTION 77:

If you are not spending funding on human exploration of Mars at this time or in FY 2009, why do you object to continuation of the limitation?

ANSWER:

Previous human to Mars studies show that there are still unanswered questions in several key technology areas. These technologies could have long development lead times and should be understood as soon as possible. Continuing the limitation on human exploration to Mars studies could significantly delay NASA's ability to send humans to Mars.

Mars Science Laboratory

QUESTION 78:

If MSL requires additional funds or incurs additional delays, what are the implications to the Mars Exploration or Planetary Science program?

ANSWER:

The MSL project is still on track to achieve a 2009 launch, but there are schedule pressures from subsystem production and deliveries. NASA is assessing its options for providing additional funds to MSL. The analysis process for financial resolution will first explore options within the Mars Exploration Program, then within the Planetary Science Division, and then outside the Division. Science Mission Directorate policy is to minimize the impacts of any particular mission to other missions and programs within the Directorate, to the maximum extent possible. This analysis is expected to be completed by the end of May 2008.

QUESTION 79:

What is the status of the independent review of MSL and when is the independent review of the MSL be complete?

ANSWER:

NASA completed a quick-look independent review, in mid-January 2008, on the magnitude of MSL cost increases and the probability of a schedule delay. NASA, with JPL, is still evaluating the cost-to-go predictions. The MSL project is solidifying production and delivery schedules to increase confidence in meeting the 2009 launch date, but they are not currently predicted to slip to a later launch opportunity. NASA and senior JPL Management are monitoring the schedules on a weekly basis, and have established a clear set of metrics to track subsystem delivery progress. Members of the January 2008 team have been added to the MSL Standing Review Board (SRB), which is an ongoing independent review team for all major project activities in accordance with NASA's processes and procedures. The next full review of MSL by the SRB will be factored into Agency decisions on cost and schedules by the end of May.

QUESTION 80:

In light of these setbacks, are the funds budgeted in FY's 08 and 09 in excess to each year's requirements?

ANSWER:

The MSL project is still on track to achieving the 2009 launch. Alternative launch dates are under consideration in the event of additional schedule problems. In either case, there are no excess Project of Program funds compared to requirements.

Mars Scout

QUESTION 81:

What was the nature of the conflict of interest, and why was it able to occur in the first place?

ANSWER:

The conflict was caused when a NASA acquisition-support contractor also provided support to one of the proposal teams, thus creating an organizational conflict of interest. This support was prohibited both in the terms of their contract and in the Mars Scout AO solicitation. NASA was unaware of the conflict until the proposals were received.

QUESTION 82:

What actions has NASA taken to address the problem?

ANSWER:

NASA has established a completely new evaluation panel. The members of the new panel have no conflicts or association with the conflicted organization. In addition, we have issued clarifications regarding potential conflicts and requested new Concept Study Reports. These will be reviewed by the new evaluation panel, which has not seen the original reports that included the conflicted organization's work. Time required to reconstitute this NASA evaluation panel was the cause of the launch slip to 2013.

QUESTION 83:

What actions is NASA taking to ensure that such a conflict does not occur again?

ANSWER:

NASA is revising the language in our solicitations and working with all of our acquisition-support contractors to ensure that all parties understand what constitutes a conflict, and ensuring that contractors have robust plans in place to identify and avoid this situation in the future.

QUESTION 84:

How will NASA ensure that the final selection is a result of a completely fair and competitive process?

ANSWER:

The new evaluation panel will review new Concept Study Reports that do not have reference to the conflicted organization's work. The panel will follow NASA's established procedures for competitive-mission proposal evaluation. In order to ensure the highest level of integrity in the selection process, the selecting official for this competition is the NASA Associate Administrator.

Space Interferometry Mission (SIM)

QUESTION 85:

Can you please elaborate for the Committee the phases of this proposal – in particular, what activities would be undertaken in FYs 08 and 09?

ANSWER:

The Explanatory Statement accompanying the FY 2008 Omnibus Appropriations Act (P.L. 110-161) identified an augmentation of $38.4M, for a total of $60.0M, to initiate the development of SIM. However, an immediate start of development for a flagship SIM mission would result in costly delay or termination of many other projects in the Astrophysics portfolio, thus eliminating diversity and balance in the Astrophysics portfolio, and would be inconsistent with the recommendations of the National Research Council (NRC) and NASA's other advisory committees.

Therefore, in its initial FY 2008 Operating Plan, NASA explained its plan to use the $60.0M appropriated to continue the formulation of SIM and to conduct studies for additional techniques to detect Earth-size exoplanets. Specifically, NASA plans to do the following in FY 2008 and FY 2009:

- Complete the detailed formulation phase (including cost and implementation plan) of a of a "SIM-Lite" mission that would meet the recommendations laid out in the two most recent Decadal Surveys for an Astrometry Astrophysics Mission, capitalizing on the previous technology investment to develop an affordable mission.
- Study a number of Earth-like exoplanet detection techniques, including astrometric techniques, which would be guided by the recently completed Astronomy and Astrophysics Advisory Committee Report on Exoplanet Studies Roadmap

The results of these activities would guide NASA's planning for FY 2010 and beyond, leading to a launch by the middle of the next decade of a medium-scale exoplanet exploration mission. NASA has made the decision that JPL will manage the next exoplanet mission. As a result, NASA expects that the activities outlined above would, for the most part, be conducted at JPL, in collaboration with the broader science community, industry, and other NASA Centers. The core competency that NASA has developed over the last decade at JPL will be leveraged to support a vigorous exoplanet exploration program within a scientifically and programmatically balance Astrophysics portfolio.

Consistent with the FY 2008 Operating Plan, NASA's FY 2009 budget request reflects a total of $272.0M for FY 2009-2013 for a new medium class exoplanet mission.

QUESTION 86:

NASA has said that it wants to stop work on SIM in large measure to ensure a scientifically and programmatically balanced astrophysics portfolio and focus on a "medium-class" exoplanet mission. Please explain for the Committee why such a "medium-class" exoplanet mission is feasible, and possible within the amounts provided in the outyears ($282 million)?

ANSWER:

The funds provided for a medium-class exoplanet mission in the out-years of the FY 2009 President's Budget Request represent the initial design and development funds for a mission that may launch in the 2016/2017 timeframe. Based on previous budget profiles in this mission class range, where peak funding occurs in the 2-3 years prior to launch, NASA would expect to invest at a similar rate to assemble and test the mission prior to launch. This medium-class budget envelope is based on: (1) available funds within a balanced mission suite, where the James Webb Space Telescope represents the current and only flagship that can be supported in the portfolio; and, (2) indications from previous, but unsuccessful, exoplanet mission proposals submitted in response to other mission opportunities (such as NASA's Discovery program) that a larger cost cap of a about $600M (exclusive of launch vehicle) could accomplish compelling exoplanet science. As in the response to

Question 85, NASA is studying mission concepts using a variety of techniques for directly or indirectly detecting planets orbiting other stars. NASA intends to use a merit-based review process to determine which technique can provide the best results within the available budget envelope.

QUESTION 87:

Isn't this just wishful thinking that NASA will be able to build an entirely new type of mission for less money than the well-studied SIM?

ANSWER:

The astrometric capabilities of SIM have been demonstrated in a laboratory environment and would represent the state-of-the-art in planet-finding using the technique of measuring a star's positional wobble to indirectly infer the presence of one or more orbiting planets (in addition to addressing other science goals). NASA has invested several hundred million dollars during the past decade in developing technology and meeting SIM project engineering milestones. Based on this experience, the SIM project is embarking on a technical study to evaluate whether a more compact, less massive, and hence, less costly architecture, relative to the 2005 baseline, could achieve performance requirements laid out in decadal surveys and related reports. In general, improvements in technology and fabrication techniques can lead to lower cost implementations. For example, the latest generation of Hubble Space Telescope instruments using the newest technologies is much more capable than the original instrument suite for roughly the same cost. It is not clear at this time, however, whether a cost savings of a factor of 2 can be realized with the SIM-Lite concept while still achieving performance comparable to the previously baselined SIM architecture; this is the purpose of the technical study being conducted with the FY 08 appropriations for SIM/SIM-Lite.

Joint Dark Energy Mission (JDEM)

QUESTION 88:

Why is more funding not allocated to JDEM in FY 2009 to speed delivery of this critical project?

ANSWER:

For an Announcement of Opportunity released in the fall of 2008, proposals will be due early in 2009 and the proposal review and selection process takes several months. The funding in FY 2009 for JDEM will support the Phase A implementation study for the dark energy investigation selected through the review process. The funding level is commensurate with this activity. By comparison, funding levels for typical Phase A studies of Explorer or Discovery missions are less than $2M. The schedule and resources for JDEM Phase A activities are intended to support a launch date in the middle of the next decade.

QUESTION 89:

What level of funding is included in the outyears to successfully implement this project?

ANSWER:

The funding levels in the years beyond FY 2009 in the President's budget request are notional, and will be reevaluated depending on the dark energy investigation and mission architecture selected. Based on funding profiles for previous missions of similar scale and complexity, the 2-3 years beyond the budget horizon may be expected to require higher annual funding by about 20 percent than the FY 2012 target in order to support a launch in the middle of the next decade, followed by an operations budget notionally similar to GLAST (over $20M per year) for a three-year prime science phase.

QUESTION 90:

What is the expected cost of the project?

ANSWER:

NASA and DOE are planning for JDEM to be a medium-class strategic mission with a competitively selected, principal investigator-led dark energy science investigation. The targeted project cost is approximately $600M (in FY 2008 dollars) plus launch vehicle costs, including a three-year prime science phase. This will be reevaluated depending on the dark energy investigation and mission architecture selected.

QUESTION 91:

What are JDEM's plans for cooperation with the Department of Energy (DOE)?

ANSWER:

NASA and DOE have tentatively agreed on a framework for partnering in the formulation, implementation, and operation of a Joint Dark Energy Mission (JDEM). Each agency will manage its own contributions, but NASA will be responsible for the overall success of the space mission. A Memorandum of Understanding (MoU) between the two agencies is being drafted that will formalize the principles of cooperation between the two agencies.

To facilitate the procurement process, the Announcement of Opportunity (AO) for JDEM will be issued by NASA, but the agencies are cooperatively writing the AO and will agree to its final wording. Both agencies will participate in the proposal evaluation and selection process. NASA will not make the section unilaterally. The details of these processes will be formalized in the upcoming DOE/NASA MoU.

The need for mission cost control dictates that each agency provide mission components for which it has established expertise and management experience, commensurate with budget availability. Thus, for example, NASA will provide the launch vehicle, spacecraft, and overall mission management for JDEM. Both agencies have long heritages of detector technology development, and both may contribute to the instrumentation payload. Each agency will manage its contributions according to its own established management protocols. Both will contribute to science operations and data processing.

QUESTION 92:

How much funding is the Department of Energy contributing to JDEM and in what fiscal years?

ANSWER:

DOE contributions to JDEM are expected to be in the areas of instrumentation, science operations, and data processing and analysis. DOE's cost for the fabrication and operations phases is estimated at this time to be up to $200M (FY 2008 dollars), roughly 25 percent of the expected total mission lifecycle cost. The year-by-year expenditures of each agency will depend on the outcome of the dark energy investigation and mission architecture selection.

QUESTION 93:

When does NASA expect to conduct and complete an open competition to select a JDEM mission? Do you anticipate any delay in holding a competition to allow a selection of a design for a FY 2009 new start?

ANSWER:

NASA and DOE are planning for JDEM to be a medium-class strategic mission with a competitively selected, principal investigator-led dark energy science investigation. To facilitate the procurement process, the Announcement of Opportunity (AO) for the JDEM dark energy investigation will be issued by NASA, but the agencies are writing the AO cooperatively and will agree on its final wording. Both agencies will participate in the proposal evaluation and selection process. The AO is expected to be released in the fall of 2008, and NASA does not currently expect any delays in the process for selecting a design and initiating a new start for JDEM in FY 2009.

Solar Probe

QUESTION 94:

Why is there no request for funding for Solar Probe in FY 2009 and only $3.4M in FY 2010 for initial concept work on a Solar Probe mission that NASA intends to launch by 2015?

ANSWER:

Our initial internal planning identified a budget profile to fund Phase A and the start of Phase B in 2010 for Solar Probe in support of the 2015 launch date. The total out-year budget projection for the Heliophysics Division (in which Solar Probe resides) is less in the FY 2009 President's budget request than was the case in FY 2008 due to a rebalancing of SMD-wide priorities. Also, other Living With a Star (LWS) missions—Solar Dynamics Observatory and Radiation Belt Storm Probes-- that are further along in development than Solar Probe, had a higher priority for FY 2009 and FY 2010 LWS Program funding.

The resulting funding profile for Solar Probe results in a slower start than originally planned, and study efforts are now focusing on a mission concept, Solar Probe Plus, that offers lower cost and enhanced performance. The funds appropriated by Congress for Solar Probe in FY 2008 will be used to fund risk reduction and technology development in both FY 2008 and FY 2009.

We plan to issue an Announcement of Opportunity for Solar Probe and select science investigations in late FY 2009. The announcement of selection of science investigations will signal the start of Phase A for the mission. A portion of the Phase A requirements for the science investigations could be funded in FY 2010 and the remainder in FY 2011.

Arecibo Observatory

QUESTION 95:

Has NASA contracted with the National Research Council, as directed, on the Arecibo Observatory?

ANSWER:

NASA has negotiated details of the task with the NRC and is proceeding to initiate the directed study on the Survey and Hazard Mitigation for NEOs, to include use of the Arecibo Observatory. The planned schedule for the study is the first report in fall 2009 and the final in spring 2010.

QUESTION 96:

Why has NASA chosen not to budget any funds for the continued operation of the Arecibo Observatory pending the interim report of the National Research Council?

ANSWER:

Per a 2002 agreement with NSF, NASA has not transferred any funding to NSF for Arecibo operation since 2005. NASA's Planetary Science Division does fund scientists that use the Arecibo radar for their NASA mission-related planetary research - $538,000 in 2008. More recently, in conversations with NSF officials, NASA has been notified that Arecibo will not need any additional funding for operations in FY 2008.

QUESTION 97:

Why does NASA not believe it needs the observatory?

ANSWER:

Arecibo Observatory is an NSF facility, and its continued operation is NSF's decision. If NSF decides to close the facility, NASA has access to similar, but not equal, capabilities at its Goldstone facility.

QUESTION 98:

What are the annual costs associated with the Observatory?

ANSWER:

This question should be directed to NSF, the Federal agency that funds the Observatory. NASA has limited insight into the annual costs associated with the Observatory.

Space Communications and Navigation

QUESTION 99:

The budget does not include funding for an upgrade of the Deep Space Network as had been expected. Why?

ANSWER:

The Science Mission Directorate (SMD) and the Exploration System Mission Directorate (ESMD) are reassessing their requirements for the post 2015 timeframe. The Space Communications and Navigation (SCaN) Office is conducting a study for the modernization and upgrade of the system to be included in future budgets. The study will examine replacement of the 40+ year-old 70-meter diameter antennae at Goldstone, California; Madrid, Spain; and Canberra, Australia. NASA will review alternatives for providing the communication services required by future deep space missions needing large aperture antennas.

QUESTION 100:

When is NASA expected to send its future communications architecture plan to Congress as directed by the 2005 NASA authorization?

ANSWER:

NASA has already delivered to Congress a top-level architectural concept for an integrated Space Communications and Navigation (SCaN) network encompassing all the services provided by the present Near-Earth, Space, and Deep-Space networks and accommodating all future NASA needs. The Space Operations Mission Directorate (SOMD) has assembled a diverse team of subject matter experts to roadmap all activities, technologies, and investment strategy leading to the build-up of the integrated network. Study efforts are focused on the Earth Relay system (the Tracking and Data Relay Satellite System, or TDRSS) and the communications and navigation capability required for future deep space missions (currently DSN). The Agency should complete the detailed architecture roadmap by the end of this fiscal year.

QUESTION 101:

Does that plan maintain the current networks, such as the Deep Space Network forever?

ANSWER:

NASA is currently studying alternative architectures as part of the Future Communications Architecture plan noted in the response to Question #100, above, and will select the best value architecture alternatives for inclusion in the plan. Continuation of the DSN is one of the options being studied. Since the Agency is evaluating architectures based on their best value, NASA is considering the architecture's ability to meet future requirements as well as associated costs. The need to connect with deep space missions requires at least three antenna locations around the Earth, and since the DSN is already established, there is a high probability that the selected architecture will involve all or parts of the existing DSN infrastructure for NASA's future capability. The systems used, however, may be considerably different than the systems currently installed at those locations.

AERONAUTICS

QUESTION 102:

Mr. Administrator, in each of the last several years, the Congress has added funds to your request for aeronautics research. In each subsequent year, NASA has not elected to request continued funding at those levels, and has sought a reduction. If aeronautics research and development is important to you and this Administration, why is the budget declining again?

ANSWER:

NASA's Aeronautics program conducts cutting-edge, long-term research in areas that are well aligned with the National Aeronautics R&D Policy guidance and with the high-priority national aeronautics R&D goals and time-phased objectives established by the National Plan for Aeronautics R&D and Related Infrastructure.

The FY 2009 request continues to reflect the augmentation—over the FY 2008 five-year request—of $140M over four years, beginning in FY 2009 that was included in last year's budget plan, as follows:

	FY 2009	FY 2010	FY 2011	FY 2012
Direct Request	446.5	447.5	452.4	456.7
Augmentation Included	[21.7]	[33.8]	[39.0]	[45.9]

NASA's Aeronautics program achieves its expected role and contributions within the current budget by focusing on NASA's unique capabilities and by maximizing coordination and collaborations with industry, academia, and other government agencies. For example, NASA's Aeronautics research directly addresses the fundamental research needs of the Next Generation Air Transportation System (NextGen) by bringing NASA's unique capabilities in partnership with the member agencies of the Joint Planning and Development Office.

The significance and importance of the National Aeronautics R&D Policy is that the Policy articulates principles, objectives, and guidelines to achieve the goal of advancing U.S. technological leadership in aeronautics. It clearly defines the role of the Federal Government in aeronautics R&D, and lays out the roles and responsibilities of the various relevant departments and agencies. It also calls for coordination among the departments and agencies – both in the development and implementation of national aeronautics R&D activities and in the managing of critical national research, development, test, and evaluation infrastructure required to maintain and advance U.S. experimental and computational aeronautics R&D capabilities.

QUESTION 103:

Each year the Congress has augmented NASA's request for aeronautics research. Yet, I was surprised to learn from conversations with program managers at NASA that the annual Congressional augmentation has been spent on lower priority, short-term, less critical investments. Dr. Griffin, what is your assessment of the expenditure of Congressional augmentations in aeronautics research – has it helped buy down the longer-termed investments needed to improve air congestion, delays and the like, or not?

ANSWER:

NASA's budget request already supports our highest priority investments. Any Congressional augmentation would necessarily fund lower priority projects. Upon receipt of the FY 2007 and FY 2008 Congressional augmentations, each Program in NASA's Aeronautics Research Mission Directorate used a strategic prioritization process to identify short-term investments that would provide the best benefit to the Nation's tax-payers in the longer-term. In some cases—in support of the Next Generation Air Transportation System (NextGen) and improving facilities and capabilities—NASA did use the additional funds to make long-term investments.

For the allocation of the FY 2008 appropriations augmentation, please see the response to question #104 below.

QUESTION 104:

How does NASA plan to spend the $71 million added by Congress last year? Can you tell us, Dr. Griffin?

ANSWER:

The $71.3M includes a direct augmentation of $59.2M plus an increased overhead assessment of $12.1M. $6.0M will be added to the Aviation Safety Program, $20.0M to the Airspace Systems Program, $30.2M to Fundamental Aeronautics, and $3.0M to the Aeronautics Test Program to increase planned research activities in these programs in FY 2008. NASA allocated the FY 2008 appropriations augmentation to the three Aeronautics Research Programs consistent with the funding priorities reflected in the FY 2008 President's budget request. The breakdown of the FY 2008 budget augmentation by research project is shown below.

Aviation Safety Program (+$6.0M)

The funds are being used for an independent assessment of the NAOMS methodology by the National Academy of Sciences National Research Council (NRC). The funds are also being used to increase investment in data mining for Integrated Vehicle Health Management (IVHM) and human factors research for Integrated Intelligent Flight Deck (IIFD), which supports the R&T challenges from the NRC Decadal Survey of Civil Aeronautics to develop methods to use operational data to assess leading indicators for safety and to develop interfaces and procedures that support human operators in effective task and attention management. The funds are providing for a new investment in system health monitoring of the NextGen airspace system and vehicles, which supports the recently released National Aeronautics R&D Plan fundamental safety challenge to understand and predict system wide safety concerns through health monitoring of system-wide functions that are integrated across distributed ground, air, and space systems. The funds are also being invested in the development of publicly distributable safety data mining sets for data mining tool development in IVHM that will benefit both in-house and out-of-house research.

Airspace Systems Program (+$20.0M)

In support of the NextGen R&D Plan, the funds are being used to conduct R&D to validate NextGen trajectory based operations by procuring software and simulation development capabilities in the areas of off-nominal scenario definition, integration of weather data with automation, and functional allocation between ground and aircraft for automated separation assurance. The funds are also being used to establish a NRA that promotes innovation in the foundational disciplines of navigation, control and avionics for autonomous systems, operations and decisions with broad potential application to ATM research. The funds are being used to accelerate R&D to validate and demonstrate the ability to safely transition new capacity-increasing capabilities and technologies into NextGen. This includes the development of an integrated test plan that identifies a series of phased simulations, demonstrations and trials to validate NextGen, and the conduct of simulations to validate and demonstrate at least one NextGen concept that is under investigation by FAA-NASA-JPDO Research Transition Teams.

Fundamental Aeronautics Program (+$30.2M)

The funds are being used to expand opportunities for system-level fundamental research in the Subsonic Fixed Wing, Subsonic Rotary Wing, Supersonics, and Hypersonics projects that involve large-scale wind-tunnel and/or flight testing in support of NASA's mid- and long-term goals. These efforts largely involve system-level experimentation and design to ensure that some of the innovative foundational concepts and technologies already being pursued by the Program can be shown to be beneficial at the aircraft system level. All opportunities are fully responsive to the highest priorities/recommendations of the NRC Decadal Survey of Civil Aeronautics and the vast majority can contribute to more environmentally friendly aircraft and rotorcraft (through better performance, reduced noise, and reduced emissions). A number of the research opportunities target the integration of future vehicles and vehicle technologies into the NextGen. The main focus of the additional efforts is to ensure the robustness of the research program at the multi-discipline and system levels, and to address the significant integration challenges that result from the interaction of conflicting requirements that will need to be met by future aircraft. In addition, key research issues to enable advanced vehicles (subsonic, supersonic, and rotorcraft) that can only be addressed at the system level are being pursued. NASA's aircraft research goals have been organized into three generations of vehicles beyond the current one: "N" (for which the Boeing 787 and Airbus 350 are representative vehicles); "N+1," which represents the next generation of tube-and-wing aircraft with entry into service, market permitting, around 2015; and "N+2," which refers to advanced aircraft in the generation after "N+1," that are likely to use revolutionary configurations (such as hybrid wing-body, small supersonic jets, cruise-efficient short take-off and landing, advanced rotorcraft) and are expected to enter into service, market permitting, in the 2020–2025 time frame. Investments include: (1) the advancement of hybrid wing-body vehicle ("N+2") technologies for low noise, higher performance, and better engine/airframe integration, that will include continued flight tests of the X-48B platform for acoustics validation data and large-scale airframe/propulsion integration demonstrations and data acquisition opportunities; (2) the system-level understanding of laminar flow control techniques for application in "N+1" concepts including the testing of a baseline open configuration that can be shared by the entire aerospace community and the acceleration of flight testing of promising technologies including the use of distributed roughness elements; (3) studies into the necessary technologies and integration approaches to realize significantly improved gas turbine engines; (4) efforts to assess the validity and applicability of biofuels/alternative fuels of various different sources to aviation applications; and, (5) approaches to improve the viability of both supersonic transports and advanced rotorcraft by conducting collaborative tests of fully integrated airframe/inlet/engine/nozzle propulsion systems and actively-controlled rotors that use the twist of the blades to effect control. In all efforts, the focus is on understanding the research implications of system-level integration. The identified research opportunities encompass significant efforts to be pursued through the NRA and in collaboration with a number of industrial organizations. In addition, a number of instrumentation upgrades for various existing facilities are being pursued to both enhance these new data acquisition research opportunities and to make possible certain system-level experiments that cannot be carried out today.

Aeronautics Test Program (+$3.0M)

ATP investments will contribute to both the NASA Strategic Plan and the National Aeronautics Research and Development Policy by ensuring the continuous availability of a portfolio of NASA-owned wind tunnels/ground test facilities which are strategically important to meeting national aerospace program goals and requirements. Additional funds will be used to support the maintenance and repair project to replace the four water pumps and the associated electrical system at the Unitary Plan Wind Tunnel (UPWT) facility. These pumps provide water to the wind tunnel heat exchangers, oil house heat exchangers, drive motor blowers, and the electrolyte heat exchanger systems. The motors have been repaired on average every three years, often causing a major disruption in facility test operations. The UPWT supports major NASA programs and provides critical testing capability for programs such as an upcoming Sonic Boom investigation. In addition, the UPWT supports the aerospace industry and is critical to the design cycle development of commercial and military aircraft. The safe and reliable operation of these systems is essential for Unitary Plan Wind Tunnel operations.

QUESTION 105:

Mr. Marburger testified before the Committee last week that NASA's aeronautics research and development programs and profile has changed recently. Can you elaborate for the Committee what changes have occurred in the portfolio and tell us what funding shifts have occurred in your budget given its new profile?

ANSWER:

During FY 2006, NASA implemented a comprehensive restructuring of its Aeronautics Research Mission Directorate (ARMD) to ensure that it was enabling the pursuit of long-term, cutting-edge research for the benefit of the broad aeronautics community. During this restructuring, NASA established three core principles that guide all decisions regarding our research portfolio:

1) We will dedicate ourselves to the mastery and intellectual stewardship of the core competencies of aeronautics for the Nation in all flight regimes;
2) We will focus our research in areas that are appropriate to NASA's unique capabilities; and,
3) We will directly address the fundamental research needs of the Next Generation Air Transportation System (NextGen) while working closely with our agency partners in the Joint Planning and Development Office (JPDO).

Given these three principles, NASA then established the four programs within the ARMD: the Fundamental Aeronautics Program, the Aviation Safety Program; the Airspace Systems Program; and the Aeronautics Test Program. The following is a description of the four programs and the research projects, with details on which projects are new and which are continuations of research activities underway prior to the restructuring.

Fundamental Aeronautics Program

The Fundamental Aeronautics program supports state-of-the-art research in tools and technologies that enable the design of vehicles that fly through any atmosphere at any speed. In particular, physics-based, multidisciplinary design, analysis, and optimization (MDAO) tools developed in this program will make it possible to evaluate radically new vehicle designs and to assess, with known uncertainties, the potential impact of innovative technologies and concepts on a vehicle's overall performance.

Although the Fundamental Aeronautics Program is leveraging research results, tools, and expertise from the former Vehicle Systems Program, it represents a distinct shift in focus. Specifically, the Vehicle Systems Program often conducted research in support of point design solutions. For example, noise reduction research typically was conducted independently of emissions reduction research; airframe-related challenges were addressed independently of engine-related challenges, and so forth. Aircraft of the future will need to address multiple and usually conflicting design challenges such as noise reduction, emissions, fuel efficiency, and performance, and addressing any one independently of the others will lead to partial solutions at best, and at worst, solutions that are misleading or ineffective. The Fundamental Aeronautics program targets research that includes continued, long-term scientific study in areas such as physics, chemistry, materials, experimental techniques, and computational techniques that leads to a furthering of our understanding of the underlying principles that form the foundation of the core aeronautics disciplines, as well as that research that integrates the knowledge gained in these core areas to significantly enhance our capabilities, tools, and technologies at the disciplinary (e.g., aerodynamics, combustion, dynamics and control, acoustics) and multidisciplinary (e.g., engine design, airframe design) levels. This integrated approach to research represents a significant departure from the stove-piped approach of the past. We also note that our focus on cutting-edge research that targets fundamental aeronautical questions that we do not yet have answers for, particularly in supersonics and hypersonics, will benefit the future space exploration initiatives of the agency. We provide project-level specifics below.

Subsonic Fixed Wing Project

The project focus is to develop improved prediction methods and technologies for lower noise, lower emissions, and higher performance for subsonic aircraft. Higher performance includes energy efficiency and operability improvements that enable advanced airframe and engine systems. The pursuit of improvements in noise, emissions, and performance is fundamental to the development of environmentally acceptable and economically viable aircraft and because of this, portions of this research have been pursued in the past, and the results of this research will be leveraged as we go forward. However, as mentioned above, the synergistic approach to these challenges is a new focus of the SFW project.

Subsonic Rotary Wing Project

The Subsonic Rotary Wing project focuses its research on the technical barriers that constrain rotorcraft from reaching widespread use in civil aviation. These barriers include range, speed, payload capacity, fuel efficiency, and environmental acceptance (especially noise). Before the ARMD re-structuring, NASA had decided to eliminate its rotary wing research, a decision that would have resulted in an irreversible loss of critical core competencies needed to ensure that rotorcraft can play a significant and enabling role in the future airspace. This project thus represents a new effort relative to the program that existed before the restructuring.

Supersonics Project

The Supersonics project has two objectives. The first one is the elimination of the efficiency, environmental (emissions, noise, and sonic boom), and performance barriers to practical supersonic cruise in the Earth's atmosphere. Previous efforts in recent years intended to focus primarily on one challenge, sonic boom mitigation. Compared to more historical efforts, the current project has no intention of developing a supersonic commercial jet; rather, we will conduct cutting-edge research to advance our knowledge, tools, and capabilities so that companies in the private sector can leverage the research results in a manner that they decide makes sense from a market perspective. The second objective of the project is to address the critical issue of supersonic deceleration to enable safe, precision planetary entry, descent, and landing of human and large science missions in any atmosphere. This represents a new focus that had not been present in our previous supersonic research programs.

Hypersonics Project

All access to space, either suborbital or in Earth orbit, and all entry from space through any planetary atmosphere, requires hypersonic flight. In order to continue to advance our capabilities for flight in these regimes, improved understanding of hypersonic phenomena is needed. NASA had previously tackled research in the hypersonic regime but had been specifically interested in atmospheric sustained flight and had focused on point-design demonstrators. The new direction of the program will tackle all of the key fundamental research issues that are required to make hypersonic flight and re-entry feasible.

Aviation Safety Program

The Aviation Safety program builds upon the unique, safety-related research capabilities of NASA to improve aircraft safety for current and future vehicles, and to overcome aircraft safety technological barriers that would otherwise constrain the full realization of NextGen. The program also provides long-term investment in research to support and sustain expert competency in critical core areas of aircraft safety. Previous aviation safety research initiatives focused largely on incremental research and on transitioning technologies that were already relatively well understood into deployable systems. In essence, both NASA and industry became development partners. As a result, there were no long-term fundamental research activities targeting the safety challenges of the future. It also meant that typically only certain companies were able to use the technologies that were developed, and that NASA, as a development partner, became a defacto partner with those particular companies in their certification issues with the FAA. Our new approach targets pre-competitive, long-term cutting-edge research and provides all the results of our aviation safety research to all of industry, as well as to the FAA and all other Government agencies that have interest in our technical investigations. As we focus our research in areas that are appropriate to NASA's unique capabilities, this also means that work that is better left to other Government agencies is no longer the focus of our research investigations. For example, we eliminated elements of our previous portfolio that were duplicative of research that belonged to the Department of Homeland Security (DHS). Details of the projects within this program follow.

Integrated Vehicle Health Management (IVHM) Project

Aircraft manufacturers and operators are continually looking for ways to improve vehicle safety and service life while decreasing service cost. Advances in digital technologies have stimulated this trend through greater integration and automation of aircraft systems resulting in greatly improved system performance and reliability. Potential benefits to aircraft safety include onboard systems capable of self-detecting and self-correcting anomalies that could otherwise go unattended until a critical failure occurs. However, there are still significant technical barriers to the full implementation of highly integrated and complex vehicle health management concepts. State-of-the-art highly integrated systems do not inherently ensure that a minor malfunction or flaw will not propagate into critical software or a hardware function and jeopardize the safety of the entire vehicle. Research is needed to address current barriers and to exploit the full potential of integrated vehicle health management technologies. The outcome could possibly revolutionize the maintenance and utilization considerations of future aircraft vehicles. In addition to aircraft applications, these technologies will enable advanced self-healing systems that will likely be useful to future space exploration vehicles. The IVHM project is a new project. We note that its creation is well-aligned with the NRC Decadal Study recommendations, which included intelligent and adaptive systems as a major theme.

Aircraft Aging and Durability (AAD Project)

Over the past decade, NASA, in collaboration with the FAA and DOD, has provided vital advances in material and structural sciences and technologies that have addressed many of the historical concerns and challenges associated with aging aircraft. However, the need to extend vehicle life and the growth in the use of composite structures and materials has caused NASA to recognize the need to augment its research in the area of advanced aging sciences. The research and technologies to be pursued within the *AAD* project will decrease the susceptibility of current and next generation aircraft and onboard systems to pre-mature deterioration, thus greatly improving vehicle safety. Such research will also likely be applicable to future space exploration vehicles. The AAD project is a new project.

The Integrated Intelligent Flight Deck (IIFD) Project and Integrated Resilient Aircraft Control (IRAC) Project

These projects are not considered new projects, because they build upon previous research activities under the old program. With the focus of our Aviation Safety research in areas appropriate to NASA's unique capabilities, FY 2006 became a transition year for the IIFD project and it now focuses on fundamental flight deck technologies of benefit to the entire aeronautics community. The scope of the IIFD project now includes the development of crew-vehicle interface technologies to reduce the risk of pilot error, the development of monitoring technologies to enable detection of unsafe behaviors, the development of fail-safe methods for changing the roles of flight crew and automation in the presence of detected disability states, and the development of a comprehensive surveillance system design that enables robust detection of external hazards with sufficient time-to-alarm for safe maneuvering to avoid hazards. NASA will no longer fund efforts that belong in the research portfolio of the DHS. To avoid duplicating research activities that the DHS sponsors as part of its mission, NASA will redirect its aeronautics resources to those areas that NASA is uniquely suited to address. That said, the goal of the IRAC project is to pursue methodologies to enable an aircraft to automatically detect, mitigate, and safely recover from an off-nominal condition that could lead to a loss of control, and such a capability will have applications that include security-related issues (e.g., the ability to respond to critical upsets would include man-made as well as naturally occurring events). NASA will continue to coordinate with the DHS and other organizations as appropriate to ensure the efficient and effective transfer of potential new breakthrough technologies.

Airspace Systems Program

The Airspace Systems Program (ASP) currently comprises two new projects: the NextGen - Airspace project and the NextGen - Airportal project. Both projects contain elements of the former ASP but have been structured to ensure closer relevance to the NextGen vision. In pursuing the goal of a transformed national airspace system by 2025, NASA's ASP is focused on the longer term, cutting-edge research necessary to create the NAS capable of supporting the tremendous throughput increases projected by the JPDO. To accomplish this, incremental research that leads to evolutionary enhancements has been set aside in favor of research that will enable revolutionary advances. Carry-over project elements include advanced traffic flow management, surface traffic management, and airspace modeling and simulation. NASA's project in small aircraft transportation systems (SATS) was successfully completed in FY 2006, and its research elements will be further matured as the restructured ASP seeks to answer the fundamental question as to the most effective allocation of functions between ground operations and flight deck operations (is distributed versus centralized control). Human factors research remains a critical element of ASP, but in contrast to the previous program, it will be conducted as an integrated part of the advanced concept development research, rather than as an isolated project. Specifically, human factors research will tackle the fundamental question regarding the degree to which automation can be effectively and safely employed within the NAS. New project technical thrust areas have been established to best respond to the anticipated needs of NextGen. Although they are new areas, the proposed work builds on well-established technical competencies. These include:

Four-dimensional trajectory-based operations;
Performance-based operations;
Dynamic airspace configurations;
Super-density operations;
Coordinated arrival/departure operations management; and,
Airportal transition and integration management.

All of these research thrust efforts will be integrated and coordinated across both projects within ASP. The essential goal of the program is to provide air transportation solutions that span the complete flight path from the departure gate to the arrival gate. This will only be possible through integration of the research in both the airspace and airportal domains. ASP is no longer conducting research in communications, navigation, and surveillance (CNS) and UAVs in the NAS, given that other federal agencies have substantial overlapping efforts in those areas.

National Academies' Decadal Survey of Aeronautics and the National Aeronautics Research and Development Plan

In December 2006, the National Science and Technology Council issued a national aeronautics research and development (R&D) plan. The plan identifies specific near-term, mid-term, and long-term goals and objectives for the Nation's aeronautics R&D effort, but it does not mention funding. Some of the plan's chapter headings use words like "vital" and "paramount" which would seem to suggest that the Administration sees aeronautics R&D as important. Similar words were again used in the National Plan for Aeronautics R&D released just this past December by the Administration.

QUESTION 106:

What critical programs to improve aviation capacity, safety, security and environmental compatibility of the U.S. air transportation system recommended by the National Academies' Decadal Survey of Civil Aeronautics are set aside given the Administration's request for aeronautics research and development at NASA?

ANSWER:

The Decadal Survey provided a total of eight top-level recommendations, five of which were addressed specifically to NASA. (The remaining three were addressed to the broader U.S. Government.) NASA is well-aligned with, and is implementing, the five NASA-specific recommendations.

A detailed response to this question was provided to Congress in August 2007 in a report titled, "NASA Response to Recommendations in the National Research

Council Decadal Survey of Civil Aeronautics."

- 47 of the Survey's 51 Research and Technology Challenges (92 percent) are well represented within NASA's aeronautics research portfolio.
- All five of the Survey's Common Themes are present throughout NASA's aeronautics research portfolio.
- NASA is conducting fundamental research that will help to provide the foundation for certification of new technologies.
- NASA is fostering intellectual partnerships with industry and academia by means of cooperative Space Act Agreements and fully and openly competed research awards that emphasize true collaborations among all partners.
- NASA has established strong partnerships with other Government agencies and organizations, including the Federal Aviation Administration (FAA), Department of Defense (DOD), and the Joint Planning and Development Office (JPDO). As a member of the National Science and Technology Council (NSTC) Aeronautics Science and Technology Subcommittee, NASA is pursuing a coordinated approach with its Government partners to managing and utilizing the Nation's research, development, test, and evaluation (RDT&E) infrastructure, which includes test facilities as well as computational infrastructure.

As noted, the technical Challenges and five Common Themes identified in the report are closely aligned with ARMD's restructured research portfolio. For example, the common themes of physics-based analysis tools and multidisciplinary design tools are present across all of our projects. We strongly agree with the report's findings that state that "an important benefit of advances in physics-based analysis tools is the new technology and systems frontiers they open. New concepts often emerge from a greater understanding of the underlying physics offered by new analytical capabilities. NASA, industry, and academia can jointly participate in research into physics-based analysis tools because it is fundamental in nature, publishable, and sharable. This research will take time to mature, yet advances can readily be translated into practice as they occur." We also strongly agree with their comments regarding multidisciplinary design tools: "The next step in the design of more complex systems involves more than just...gluing together discipline-specific analyses and optimization. New multidisciplinary tools are needed to integrate high fidelity analyses with efficient design methods and to accommodate uncertainty, multiple objectives, and large-scale systems..."

Regarding the theme of advanced configurations, we agree that the pursuit of advanced configurations, such as revolutionary aircraft concepts and advanced structural designs, can foster the implementation of innovative solutions to systems-level challenges. In fact, across our research portfolio, our focus on physics-based, multidisciplinary design, analysis, and optimization tools with quantified levels of uncertainty will enable virtual expeditions through design space in order to identify advanced configurations that have the greatest possibility of meeting multiple and often conflicting system-level requirements. Regarding the intelligent and adaptive systems theme, which "encompasses aircraft-level challenges aimed at sensing the operational environment, actively responding to that environment, and learning from the resulting interactions," our Aviation Safety Program also embraces this as an important theme. Finally, we agree that the "air transportation system must be understood as a complex interactive system", and we agree with each of the systems issues identified under that theme, and with the cautionary statement that "system models typically examine isolated effects or components within the system, and few models attempt to examine a large range of complex, interactive system effects, especially those involving nondeterministic behaviors."

Regarding environmental compatibility, three projects within the Fundamental Aeronautics Program are focused on reducing noise and emissions for both subsonic and supersonic speed regimes. The Subsonic Fixed Wing (SFW) Project is working on technologies to attain aggressive goals for noise, emissions, and performance improvements for future generations of fixed-wing vehicles starting with N+1 (the generation after the current one, represented by the Boeing-787), all the way to N+3 (two generations beyond that; expected to enter into service in the 2030-35 period). The goal of the Supersonics Project is to develop technologies that eliminate environmental and performance barriers that prevent the realization of practical supersonic cruise vehicles. Technologies are being developed to meet the environmental challenges specifically associated with supersonic aircraft, which include acceptable levels of airport noise without performance penalty, reduction of sonic boom to enable supersonic flight over land, and reduction of gaseous emissions (such as NO_X and others) at high altitudes. One of the goals of the Subsonic Rotary Wing Project is to develop technologies for reducing cabin and engine noise, which will improve the civilian potential of these vehicles while maintaining their unique benefits. In addition, all three projects are developing technologies for reducing fuel consumption, which also has the indirect effect of reducing emissions.

In addition, ARMD programs are aligned very well with the principles, goals, and objectives of the new National Aeronautics R&D Policy (December 2006), as well as the National Plan for Aeronautics R&D and Related Infrastructure (December 2007). The ARMD Associate Administrator served as the co-chair of the National Science and Technology Council's Aeronautics Science and Technology Subcommittee during the development of both the Policy and the Plan. Many senior ARMD staff including all four Program Directors also made significant contributions to the development of the National Plan for Aeronautics R&D and Related Infrastructure.

QUESTION 107:

In what way is NASA's aeronautics research budgeted not fully aligned with the National R&D Plan that was adopted just this past December?

ANSWER:

NASA's Aeronautics Research and Development Programs are fully aligned with the National Plan for Aeronautics Research and Development and Related Infrastructure. The following lists specific of the alignment of each Program with the Plan:

Airspace Systems Program

Research activities conducted in the Airspace Systems Program focus on mobility which is defined in the National Aeronautics R&D Plan, Chapter 2: "Mobility through the air is vital to economic stability, growth and security as a Nation."

From its inception, the Airspace Systems Program and its two projects (NextGen-Airspace and NextGen-Airportal) were planned using guidance from the Joint Planning and Development Office (JPDO) on the research and development that is required to achieve the Next Generation Air Transportation System (NextGen) vision. In 2007, NASA and the JPDO reviewed and agreed on the alignment of the NextGen-Airspace Project and NextGen-Airportal Project research with the JPDO R&D Plan and Integrated Work Plan. Both of these key JPDO documents were used in defining the roadmap for research for the National Aeronautics R&D Plan.

Chapter 2, focusing on mobility, identifies five specific goals:

1. Develop reduced aircraft separation in trajectory- and performance-based operations;
2. Develop increased NAS capacity by managing NAS resources and air traffic flow contingencies;
3. Reduce the adverse impacts of weather on air traffic management decisions;
4. Maximize arrivals and departures at airports and in metroplex areas; and,
5. Develop expanded aircraft capabilities to take advantage of increased air transportation system performance.

The Program leads research activities for Goals 1, 2, and 4 with the collective research output of its two projects contributing to these goals. The NextGen-Airspace Project explores and develops concepts, and integrated solutions providing research data to define and assess allocation of ground and air automation concepts and technologies necessary for the NextGen. Its fundamental research purpose is to address the demand/capacity imbalance problem in the NAS in the most safe, equitable, and efficient manner. The NextGen-Airportal Project investigates innovative new technologies, approaches, and procedures with the goal of enabling enhancements within the airport and terminal domains to meet NextGen capacity and efficiency goals.

The Program has a supporting role for Goal 3, and participates in the development of requirements for the integration of weather information into the ATM decision-making process. The Program also has a supporting role for Goal 5, and participates in the development of trade space metrics to understand realizable trades within noise, emissions and performance parameters for advanced aircraft that will operate in NextGen. 100 percent of the Program and Project budgets are focused on these five goals.

Aviation Safety Program

Research activities conducted in the Aviation Safety Program focus on safety which is defined in the National Aeronautics R&D Plan, Chapter 4: "Aviation Safety is Paramount."

The Aviation Safety Program was originally formulated in 1998 to develop technologies in support of a National Goal to reduce the U.S. aviation fatal accident rate by 80 percent by 2007. Building on that benchmark, the current Program, in collaboration with the JPDO is now focused on developing technologies in support of NextGen safety needs. In 2007, NASA and the JPDO reviewed and agreed on the alignment of the Aviation Safety Program research with the JPDO R&D Plan and Integrated Work Plan. Both of these key JPDO documents were used in defining the roadmap for the research for the National Aeronautics R&D Plan.

Chapter 4, focusing on safety, identifies three specific goals:

1. Develop technologies to reduce accidents and incidents through enhanced vehicle design, structure, and subsystems;
2. Develop technologies to reduce accidents and incidents through enhanced aerospace vehicle operations on the ground and in the air; and,
3. Demonstrate enhanced passenger and crew survivability in the event of an accident.

The Program leads research activities for Goals 1 and 2. In particular, three of the four Projects within the Program contribute to Goal 1: the Integrated Vehicle Health Management (IVHM) Project, the Aircraft Aging and Durability (AAD) Project, and the Integrated Resilient Aircraft Control (IRAC) Project. The IVHM project conducts research to advance the state of highly integrated and complex flight-critical health management technologies and systems. The AAD project develops advanced diagnostic and prognostic capabilities for detection and mitigation of aging-related hazards. The IRAC project conducts research to advance the state of aircraft flight control automation and autonomy in order to prevent loss-of-control in flight. The fourth Project, the Integrated Intelligent Flight Deck (IIFD) Project, contributes to Goal 2. The IIFD project pursues flight deck related technologies that will ensure crew workload and situation awareness are both safely optimized and adapted to the future operational environment as envisioned by NextGen. A component of the IVHM Project which focuses on research for new data-mining tools and methods also contributes to Goal 2. Additionally, research within the AAD Project relative to aging hazards for materials and structures can be applied to Goal 3. 100 percent of the Program and Project budgets are focused on these goals.

Fundamental Aeronautics Program

Research activities conducted in the Fundamental Aeronautics Program contribute to three of the principles outlined in the National Aeronautics R&D Policy:

1. Mobility through the air is vital to economic stability, growth, and security as a nation;
2. Aviation is vital to national security and homeland defense; and,
3. Assuring energy availability and efficiency is central to the growth of the aeronautics enterprise, and the environment must be protected while sustaining growth in air transportation.

The Fundamental Aeronautics Program is dedicated to the mastery and intellectual stewardship of the core competencies of aeronautics for the Nation across *all* flight regimes. The work in the Program directly benefits the public through the development of techniques and concepts for both subsonic (including rotorcraft) and supersonic vehicles that are cleaner, quieter, and more energy efficient. Research in revolutionary configurations, lighter and stiffer materials, improved propulsion systems, and advanced concepts for high lift and drag reduction all target the efficiency and environmental compatibility of future air vehicles. In addition, the Program conducts research in the hypersonic regime that, in addition to providing technologies for revolutionary, low-cost access to and from space, can be employed in systems used for national security and homeland defense.

More specifically, the National Plan for Aeronautics R&D and Related Infrastructure outlines in Chapter 2, focusing on mobility, five separate goals. The fifth goal, "Develop expanded aircraft capabilities to take advantage of increased air transportation system performance," is directly addressed by the Fundamental Aeronautics Program in collaboration with the Airspace Systems Program. A variety of different air vehicles will be enabled by the research in the FA program within the Subsonic Fixed Wing (SFW), Subsonic Rotary Wing (SRW), and Supersonic (Sup) projects. More details can be found in the actual document.

Chapter 3 of the Plan focuses on national security and homeland defense. Of the five goals outlined in that Chapter, the Fundamental Aeronautics Program contributes concepts and technologies for four of them: Goal 1 (improved airframe aerodynamic efficiency) is mainly addressed by work in the SFW project, Goal 2 (improved rotorcraft) is directly addressed by the SRW project, Goal 3 (improved gas turbine engines) is addressed by a combination of SFW, SRW, and Sup, and Goal 5 (hypersonic flight) is the subject of the research conducted in the Hypersonics (Hyp) project.

Finally, Chapter 5 of the Plan focuses on energy availability and efficiency, and protecting the environment. While the SRW and Sup projects contain major elements in support of this goal, it is the SFW project that has the largest contribution to this goal. SFW is working on technologies to enable aggressive goals for performance improvements of future generations of fixed-wing vehicles starting with N+1 (the generation after the current one, represented by the Boeing 787), all the way to N+3 (two generations beyond that; expected to enter into service in the 2030-2035 period). The SFW project contributes to Goal 1 (new aviation fuels) and Goal 3 (advanced technologies for reduced environmental impact). In fact, the entire SFW project is organized around a balanced approach to achieving performance, noise, and emissions targets that will result in the possibility of growing the NextGen without increasing the resulting environmental impact.

Aeronautics Test Program

The Aeronautic Test Program (ATP) focuses on ensuring that NASA and the Nation have the right set of wind tunnel and flight test facilities in place and that these facilities are healthy and represent the capabilities that NASA and the Nation need to support the Nation's AeroSpace plans.

The ATP activities are in alignment with the goals of Chapter 6 of the National Plan for Aeronautics Research and Related Infrastructure, specifically Goal 1, "Determine the national RDT&E infrastructure that satisfies national aeronautics R&D goals and objectives," and Goal 2. "Establish a coordinated management approach for Federal RDT&E infrastructure that is based upon a national perspective and interagency cooperation."

ATP plans and activities are done in coordination with DOD through the National Partnership for Aeronautical Testing (NPAT) Council and with industry through the U.S. Industry Test Facilities Working Group. This close coordination ensures a national perspective is inherent in the definition and implementation of ATP plans.

QUESTION 108:

What is the technology readiness level for aeronautics research? Why isn't aeronautics funding research at that level to facilitate increased technological transfer to industry and the FAA?

ANSWER:

NASA believes in focusing on "knowledge transition" rather than "technology transition." Focusing on "technology transition" tends to drive one to focus on devices and widgets, rather than on the knowledge that enables their creation. In order to ensure that what we do benefits the community broadly, we have to ensure that the knowledge and understanding that underpins any new technology is transferred to the community in such a way that that technology can be broadly applied.

NASA intends to disseminate the results of its research as broadly as possible and in as timely a manner as possible by publishing our results in peer-reviewed journals and NASA Technical Reports. Furthermore, we use technical working groups within each project to engage industry and academic partners on a regular basis in order to facilitate knowledge transfer. Space Act Agreements (SAAs) are also being used to establish intellectual partnerships with industry that enable NASA to leverage industry's unique systems-level expertise while enabling industry to quickly acquire research results and establish close working relationships with the researchers both internal and external to NASA who contribute to the research. To date, we have established more than 35 SAAs. During FY 2007, we published one book, 132 peer-reviewed journal articles, 11 NASA TPs, 39 NASA TMs, and 426 papers presented at technical conferences.

With regard to the fundamental research that we conduct in support of the NextGen, the algorithms, concepts, tools, and technologies that we develop will be broadly disseminated, and through our collaborative research partnerships with the other member agencies of the JPDO as well as the private sector, will be easily accessible to all stakeholders.

NASA Aeronautics, the FAA Air Traffic Organization (ATO), and the JPDO are working collaboratively to establish a process to transfer technologies from fundamental research and development (R&D) into implementation for the NextGen. This process, which ensures research is sufficient and appropriate to enable

NextGen, has top-level commitment from NASA Associate Administrator for Aeronautics, and FAA Vice President for Operations Planning Services, Air Traffic Organization. A coordinating committee that includes both FAA and NASA representatives oversees four initial research transition teams that are organized around the NextGen Concept of Operations framework. This framework connects the FAA's Operational Evolution Partnership elements with the NASA research. The JPDO has an important role in the transfer in that they will inform the Integrated Work Plan with progress. The teams are working to plan near-term R&D transition in areas such as surface management and long-term transition in areas such as dynamic airspace allocation. With regards to an initial collaborative Research Transition Team activity, more than 35 participants from FAA service units, NASA, MITRE/CAASD, and industry attended a workshop in Washington, DC, in February 2008 to focus on integration of NASA and FAA research plans, schedules, roadmaps, and coordinated simulations for near term NextGen Trajectory Management objectives.

QUESTION 109:

What levels of investment is NASA making in "green" research directed at noise and emissions improvements and energy consumption reduction in FYs 2008 and 2009?

ANSWER 109:

NASA's programs have been organized to develop key concepts, methods, and technologies that, jointly with the FAA and the Joint Planning and Development Office (JPDO), will enable the next generation air transportation system (NextGen), which will accommodate the required increases in capacity in a safe, dependable and efficient manner while reducing the impact of aviation on the environment.

As NextGen evolves to handle the projected growth in the national air transportation system, NASA's Fundamental Aeronautics Program is working to answer two major questions that the system will face:

1. How will we continue to reduce the environmental impact of aviation (in terms of noise, local and global emissions, and local air quality) despite its very significant growth? and,
2. What kinds of advanced vehicles will be required to satisfy the forecasted demand and levels of environmental compliance?

In addition, the Airspace Systems Program is ensuring that new generations of vehicles can operate within the NextGen in a manner that is conducive to minimizing the environmental impact of aviation. These efforts represent very significant investments in "green" aircraft research initiatives being led by NASA ARMD.

As the number of flight operations at many of the largest airports in the nation continue to increase, environmental concerns over noise and emissions will limit the capacity of those airports, and therefore, of the entire system. By 2025, the demand for air transportation will be satisfied by a variety of different classes of aircraft. The Fundamental Aeronautics Program is developing "green" ideas, technologies, and tools that will one day enable the development of highly efficient and environmentally friendly aircraft (including subsonic vehicles; supersonic aircraft; and vehicles with the ability to take-off and land on short runways, yet cruise at transonic speeds efficiently) and rotorcraft to meet the performance and environmental requirements that will be demanded by the public.

In summary, NASA's Aeronautics Programs have been developed with a main objective to substantially reduce the environmental impact of aviation. NASA's activities in 2008 will further these goals, such as:

1. The advancement of hybrid wing-body vehicle ("N+2") technologies for low noise, higher performance, and better engine/airframe integration. These efforts have the potential of enabling aircraft with significantly reduced noise and emissions.
2. The system-level understanding of laminar flow control techniques for application in "N+1" and "N+2" concepts. Laminar flow technology can significantly decrease the fuel burn of both conventional and unconventional aircraft and, therefore, can accomplish significant CO2 emissions reductions (up to 50% better than the current state of the art).
3. Studies into the necessary technologies and integration approaches to realize significantly improved gas turbine engines.
4. Efforts to assess the validity and applicability of biofuels / alternative fuels of various different sources to aviation applications.
5. Approaches to improve the viability of both supersonic transports and advanced rotorcraft in the NextGen, with environmental constraints built in.

In addition, NASA is currently planning a solicitation for the "N+3" generation of advanced vehicles (see http://www.aeronautics.nasa.gov/fap) that will have dramatically improved environmental performance to the point that emissions of CO2 will be reduced by up to 70 percent and the noise of such aircraft will be barely noticeable outside of the boundaries of the airport.

NextGen

NextGen is a wide ranging transformation of the entire national air transportation system — not just certain pieces of it -- to meet future demands and avoid gridlock in the sky and in the airports. It moves away from legacy ground based technologies to a new and more dynamic satellite based technology. Technologies and activities that support this transformation are currently part of NASA's and FAA's investment portfolio and represent a step beyond current legacy modernization programs. These new capabilities and the highly interdependent technologies that support them will change the way the system operates, reduce congestion, and improve the passenger experience. This multi-agency initiative is led by the Joint Planning and Development Office. The budget includes $74.6M for NextGen, a decrease of $25.5M from last year's enacted level.

QUESTION 110:

Dr. Griffin, can you please help the Committee understand how a cut of $25 million from Airspace Systems – which funds the agency's air traffic control management work in support of NextGen – generates confidence in NASA's ability to meet its future responsibilities and addresses the "technology gap" in an urgent manner?

ANSWER 110:

All three of NASA's aeronautics research programs (Fundamental Aeronautics Program, Aviation Safety Program and Airspace Systems Program) contribute directly and substantively to the Next Generation Air Transportation System (NextGen) vision. The programs address multiple NextGen research challenges, including noise, emissions, fuel efficiency, vehicle performance, and safety, as well as airspace and airportal operational performance.

The enacted direct FY 2008 budget for the Airspace Systems Program is $100.1M, which includes the FY 2008 augmentation of $20.0M. The FY 2009 President's Budget request for FY 2009 is $74.6M; therefore the delta between the President's Budget Request for the two years is $5.5M. The combined budget for 2008 and 2009 remains $14.5 million higher than the planned level.

NASA Aeronautics, the FAA Air Traffic Organization (ATO), and the JPDO are working collaboratively to establish a process to transfer technologies from fundamental research and development (R&D) into implementation for the NextGen. This process, which ensures research is sufficient and appropriate to enable NextGen, has top-level commitment from NASA Associate Administrator for Aeronautics and FAA Vice President for Operations Planning Services, Air Traffic Organization. A coordinating committee that includes both FAA and NASA representatives oversees four initial research transition teams that are organized around the NextGen Concept of Operations framework. This framework connects the FAA's Operational Evolution Partnership elements with the NASA research. The JPDO has an important role in the transfer in that they will inform the Integrated Work Plan with progress. The teams are working to plan near-term R&D transition in areas such as surface management and long-term transition in areas such as dynamic airspace allocation. With regards to an initial collaborative Research Transition Team activity, more than 35 participants from FAA service units, NASA, MITRE/CAASD, and industry attended a workshop in Washington, DC, in February 2008, to focus on integration of NASA and FAA research plans, schedules, roadmaps, and coordinated simulations for near term NextGen Trajectory Management objectives.

QUESTION 111:

Given the importance of NextGen to the Nation and the increased level of frustration of the American public with interminable travel delays, what research is NASA's aeronautics program conducting under its Airspace Program to address this issue?

ANSWER:

NASA Aeronautics will continue to address the fundamental research needs of NextGen by conducting applied R&D for advanced vehicles, safety and air transportation systems. Fundamental research includes foundational physics, discipline and multi-discipline studies and system-level integration. The Fundamental Aeronautics, Aviation Safety, and Airspace Systems Programs conduct this research.

Under the NextGen Acceleration Action Plan, the FAA will implement several algorithms that were completed by NASA under the Airspace Systems Program. These algorithms include aircraft sequencing and scheduling under airport constraints and surface management. Because the research is complete and the algorithms have already transitioned to the FAA, NASA will have at most a limited consulting role for implementation.

NASA's direct contribution to the Action Plan, however, is to accelerate validation studies that are coordinated with the FAA and JPDO via Research Transition Teams. In particular, NASA will accelerate validation and demonstration of methods related to traffic management advisor and surface management. The NASA and FAA Research Transition Team co-leads have been identified for both surface and traffic management, and are currently planning workshops to establish joint roadmaps. In addition, NASA will collaborate with the FAA to insure that research studies focus on regions, such as south Florida, that are targeted for FAA demonstration and implementation. NASA's contribution, which is consistent with our long-term research role, will enable the FAA to increase the impact on air transportation system capacity of the initial deployments as expanded capabilities are proven, thus helping to mitigate the frustration of the American flying public and reduce air travel delays.

Lastly, the FAA has expressed an interest in accelerating the implementation of technologies for closely spaced parallel runways. NASA is reviewing its portfolio in super density operations to determine if planned studies address the FAA's concept exploration requirements for closely spaced parallel runways.

QUESTION 112:

In the past NASA has complained that the absence of an Enterprise Architecture and an integrated Work Plan for NextGen has caused lack of agreement among Joint Planning and Development Office member agencies. In January 2007, JPDO released its first R&D plan. That being said how is NASA's roadmap better refined now?

ANSWER:

NASA's aeronautics research is aligned with the goals of the National Aeronautics Research and Development Policy, the National Plan for Aeronautics Research and Development and Related Infrastructure, the findings and recommendations of the NRC Decadal Study, and the planning documents for Next Generation Air Transportation System (NextGen) as created by the Joint Planning and Development

Office (JPDO).

NASA's Aeronautics Research Mission Directorate (ARMD) has worked closely and diligently with the JPDO member agencies in the development of the NextGen R&D Plan and has come to agreement on the plan elements and specifically the ARMD contributions. Version 1 of the R&D Plan was completed in 2007; and it has been incorporated into Version 0.2 of the Integrated Work Plan (IWP). The IWP will include comprehensive coverage of the NextGen operational improvements, roadmaps, as well as the R&D plan. The JPDO has initiated an effort on March 13, 2008, to conduct a gap analysis to reexamine potential R&D gaps in the context of the IWP including updated roadmaps and operational improvements. NASA ARMD is collaborating directly with the JPDO as part of a multi-agency team to conduct this assessment. As the IWP further matures, ARMD's research programs will review their investment portfolios to ensure the most appropriate support for NextGen. Version 1.0 of the IWP will be released this summer.

QUESTION 113:

Since the obstacles cited by NASA in the past have been removed, does this not warrant NASA's renewed vigor in aeronautics R&D?

ANSWER:

NASA currently has a vigorous aeronautics research program that is fully aligned with the National Aeronautics Research and Development Policy and the National Plan for Aeronautics Research and Development and Related Infrastructure. NASA interacted closely with the JPDO during the ARMD restructuring to ensure proper alignment of its research plans with the needs of the NextGen. As a result of this close coordination, each ARMD Program conducts research that directly addresses the future challenges of the NextGen, as detailed below. With the recent release of JPDO planning documents, NASA continues to coordinate its efforts with the other agency members of the JPDO to ensure continued alignment of its efforts with the stated goals.

In addition, NASA provides workforce, analysis tools, and funding directly to the JDPO in order to assist with the JPDO's responsibility of planning, coordinating and overseeing the research and implementation for the NextGen. NASA is currently the only agency partner in the JPDO other than the Federal Aviation Administration (FAA) that is directly contributing funds for these activities.

The Airspace Systems Program

The Airspace Systems Program addresses the air traffic management research needs of NextGen and is comprised of two projects: NextGen-Airspace and NextGen-Airportal. The two projects are designed to make major contributions to future air traffic needs by developing en route/transitional/terminal capabilities and surface capabilities. Both projects are, much like the airspace system itself, highly integrated, and pay close attention to information management at critical transition interfaces in the National Airspace System (NAS). The NextGen-Airspace project will conduct relevant research to assist the JPDO in the detailed definition and development of the NextGen National Plan. The project will explore and develop concepts and provide research data to define and assess the allocation of ground and air automation concepts and technologies necessary for NGATS. Specific technical goals include:

- Increasing capacity through dynamic allocation of airspace structure and controller resources;
- Effectively allocating demand through departure time management, route modification, adaptive speed control, etc., in the presence of uncertainty;
- Reducing the capacity-limiting impact of human controlled separation assurance by developing methods to improve sequential processing and merging of aircraft in transition and cruise airspace;
- Developing accurate trajectory predictions that are interoperable with aircraft flight management systems and account for prediction uncertainty growth and propagation;
- Quantifying the performance-enhancing effects of emerging airborne technologies; and,
- Developing an approach and computer-modeling tools that can evaluate the systematic impact of new technologies and capabilities for the NextGen.

The NextGen-Airportal project will enable capacity improvements in the terminal and airport domains of the NAS and will explore ways to achieve maximum productivity in the combined use of gates, taxiways, runways, terminal airspace, and other airportal resources. Project research will contribute to technologies, operational procedures, and systems needed to expand NAS capacity to meet future demand with fewer delays and increased throughput. Specific technical goals include:

- Developing trajectory-based automation technologies to increase the safety and efficiency of surface operations and minimize runway incursions in all weather conditions;
- Enabling reductions in arrival and departure separation standards while balancing arrival, departure, and surface capacity resources at a single airport; and
- Enabling the use of dynamic NextGen resources by addressing the following challenges in the airportal environment: (1) creation of seamless traffic flow by integration of dynamic operator roles, decision aids, sensor information, airportal and terminal area constraints, real-time weather information, and, regional/metroplex operations; and, (2) identification and understanding of new roles, responsibilities and authority required between humans and automation.

The Fundamental Aeronautics Program

The Fundamental Aeronautics Program addresses research of importance to NextGen through three of its four projects. The key system-level objectives that drive the research investment portfolio in the Subsonic Fixed-Wing, Subsonic Rotary-Wing, and Supersonic projects are strongly driven by the projections established by the JPDO for expected growth in capacity. This includes focusing on aircraft technology and concepts to eliminate the potential "exponential growth" in delays that could result at the Nation's major airports. Because strong, sustained growth will never be possible without consideration of the environment and energy consumption, the three projects will continually adjust research goals for reduced noise, emissions and energy consumption to enable "growth without impact" consistent with future JPDO projections.

The Aviation Safety Program

The Aviation Safety Program worked closely with the FAA and the JPDO in developing its research plans with a focus on developing cutting-edge technologies to improve the intrinsic safety attributes of current and future aircraft that will operate in the global NextGen. Four projects comprise the Aviation Safety Program:

- The Integrated Vehicle Health Management (IVHM) project will conduct research to advance the state of highly integrated and complex flight-critical health management technologies and systems;
- The Integrated Intelligent Flight Deck (IIFD) project will pursue technologies related to the flight deck that ensure crew workload and situation awareness are both safely optimized and adapted to the future operational environment as envisioned by NextGen;
- The Integrated Resilient Aircraft Control (IRAC) project conducts research to advance the state of aircraft flight control to provide onboard control resilience for ensuring safe flight in the presence of adverse conditions (e.g., faults, damage and/or upsets); and,
- The Aircraft Aging and Durability (AAD) project develops advanced diagnostic and prognostic capabilities for detection and mitigation/management of aging-related hazards in order to decrease the susceptibility of current and next generation aircraft and onboard systems to pre-mature deterioration, thus greatly improving vehicle safety.

National Aviation Operations Monitoring Service (NAOMS)

In response to direction in the Explanatory Statement accompanying the FY 2008 Omnibus Appropriations Act, NASA submitted a report dated March 28, 2008, to the Committees on Appropriations regarding NAOMS.

QUESTION 114:

What can you tell us about NASA's revalidation of NAOMS?

ANSWER:

The Appropriations Committee language states that "NASA should provide a report to the Congress within 90 days of enactment of this Act on its plans for completing the validation of the survey methodology and restarting the NAOMS survey data collection."

In carrying out those plans, NASA has enlisted the National Research Council (NRC) to conduct an independent assessment of the NAOMS methodology. This assessment will be based on the redacted NAOMS survey response information that NASA has already placed in the public domain, including the final NAOMS contractor report, as well as various NAOMS project briefings. Currently, NASA and the NRC are discussing whether adequate protections can be established to allow the NRC to utilize unredacted survey response information for their assessment. An initial assessment is expected from the NRC by December 31, 2008, and the NRC will complete a final report by mid-2009. In addition to assessing the NAOMS methodology, the NRC could, if the methodology is determined to be valid, provide recommendations on the most effective ways to use the NAOMS survey response information. NASA will submit the NRC interim and final report to the Committees on Appropriations.

QUESTION 115:

Is NASA continuing to collect NAOMS data?

ANSWER 115:

NASA has no plans to resume the NAOMS data collection, or to perform trend analysis on the existing survey responses. NASA believes it would be premature to consider restarting a NAOMS data collection effort until the NRC has completed the assessment of the original activity. A 2004 review of NASA's effort by the National Academies concluded that it "does not see a compelling argument" for continued NAOMS data collection.

The original plan for the NAOMS project was a transition system to an organization with an operational focus. As a result, NASA transferred the NAOMS survey methodology to the Air Line Pilot's Association in FY 2006. This decision was also supported by the results of the 2004 National Academies' review and the fact that NASA has continued to support other independent aviation safety reporting systems such as the Aviation Safety Information Analysis and Sharing (ASIAS) system implemented by the Federal Aviation Administration (FAA).

Last year, a NASA team chartered by the Administrator examined the NAOMS survey response information collected by NASA from 1998 to 2004, and developed an initial redaction strategy and directed the Battelle Memorial Institute (NASA's contractor for the NAOMS project) in the execution of that strategy. The result was an initial release of redacted survey response information to the public on the NASA website on December 31, 2007. Since then, the website has been updated with additional data and information. In March 2008, the Associate Administrator chartered another NASA team to continue analyzing what additional survey response information can be released without compromising commercial confidentiality and anonymity. NAOMS survey respondents were promised that their responses would be confidential and not be traceable to any individual. It is vitally important to maintain the trust that has been established with the pilot community and minimize any adverse effects on future pilot reporting to other aviation safety systems. NASA plans to complete this team's effort by the end of this calendar year.

SPACE SHUTTLE

QUESTION 116:

In light of the Shuttle flight delays that have occurred since the Shuttle's return to flight after the *Columbia* accident, how realistic is it to assume that the Shuttle will be able to complete all the remaining missions on its manifest by October 2010?

ANSWER:

The planned flight rate is realistic and consistent with past performance. NASA plans to fly 9 more Space Shuttle mission (8 flights to ISS plus 1 servicing mission to the Hubble Space Telescope) between now and retirement in FY 2010. NASA will also fly two additional contingency flights to the Space Station if they can be accomplished before 2010 retirement. Even with the potential for the two contingency flights, the manifest equates to a flight rate of 4-5 missions per year. There is some flexibility still remaining in the schedule to address unanticipated events, but NASA will reassess the manifest if one or more flights appear to be slipping into 2011.

QUESTION 117:

How will NASA avoid the schedule pressure that the *Columbia* Accident Investigation Board warned against when NASA's need to complete the Space Station's assembly and repairing the Hubble telescope creeps up against the ever-looming October 2010 deadline?

ANSWER:

Since the *Columbia* accident in February 2003, NASA has demonstrated its willingness to stand down and resolve technical issues that affect flight safety in the Space Shuttle program, regardless of the potential impact to the schedule. Two of the more significant recent examples include the redesign of the protuberance air load ramp foam on the External Tank between STS-114 and STS-121, and the troubleshooting of the engine cut-off sensors during STS-120. NASA will continue to evaluate the Space Shuttle manifest as necessary consistent with retiring the Space Shuttle in FY 2010. Another important step NASA has taken to avoid schedule pressure is to limit the number of flights that the Shuttle is scheduled to fly before retirement. The Shuttle currently has only 9 flights left on the manifest (plus a potential two more contingency flights that will only fly if they can be flown safely by the end of 2010).

QUESTION 118:

At what critical juncture will NASA know that it will not be able to complete all of its remaining missions on its manifest?

ANSWER:

NASA believes that the Space Shuttle can complete the last 9 flights on the Space Shuttle manifest, as well as the two contingency flights, by the close of FY 2010, and will keep the Congress informed of any changes to the Shuttle manifest.

QUESTION 119:

What elasticity is built into the Shuttle's schedule?

ANSWER:

STS-131, the final Space Station assembly mission, is notionally scheduled for April 2010, five months before the end of the fiscal year, and the retirement of the Space Shuttle. If both of the budgeted "contingency" missions are approved, the final Shuttle flight would occur in July 2010, but these flights will not be flown beyond FY 2010, in any case. NASA has built this elasticity into the end of the Shuttle manifest to ensure that the Space Station assembly flights will be completed before the end of FY 2010.

QUESTION 120:

What is the priority of the Hubble repair mission? Should additional Shuttle launch delays occur; will the Hubble mission likely slip?

ANSWER:

The upcoming mission to service the Hubble Space Telescope -- Servicing Mission 4 -- is of high priority for NASA. Since the launch of Hubble in 1990, the observatory has captured scientifically valuable and visually compelling images of astronomical phenomena, from our own solar system to the farthest reaches of the cosmos. In late summer, Shuttle Atlantis will fly the STS-125 mission to service the Telescope. There are a variety of exigencies that *could* arise and necessitate a slip to the launch readiness date of the mission; NASA is committed to flying this mission, however, and we will keep the Congress informed of any changes to STS-125's launch date.

QUESTION 121:

When must NASA carry out the Hubble repair mission, noting that the current launch is scheduled for 2008?

ANSWER:

The driving consideration for carrying out the Hubble Space Telescope (HST) servicing mission is the availability of the Space Shuttle, which will retire at the end of 2010. In addition, the requirement to have two vehicles available to do this mission at an equivalent level of safety to the rest of the manifest, are key drivers to the schedule planning. Additional consideration must be given to the needs of the Constellation Project to convert one of the Space Shuttle launch sites and mobile launch platforms for initial test flights of the ARES I. Once one launch site becomes unavailable for Shuttle missions, NASA will not have the ability to have two Shuttles available for the HST mission.

While the desire to upgrade the science capabilities of the HST's and to keep the observatory healthy motivates the servicing mission, the condition of the telescope is not the driving constraint on the schedule.

Extending or Adding Shuttle Missions

The Committee understands that the last two flights in the Shuttle manifest are for the provision of necessary spares for the Space Station that can only be brought up to the Station by the Shuttle. Yet, these flights have not been incorporated to the baseline, in essence, signifying the absence of a commitment by the Administration to complete these missions.

QUESTION 122:

Dr. Griffin, you are quoted as having said, "If I had the authority I would have added the shuttle flight and we would not be having this discussion." Sir, were you commenting on whether you have the authority to add additional Shuttle flights before the 2010 deadline or the authority to manifest the Alpha Magnetic Spectrometer on an additional flight after 2010?

ANSWER:

The question is to some degree moot because NASA already has contracts in place to reflect the final orders of Space Shuttle Program hardware as we move toward Shuttle retirement in 2010. Recent examples include modifications to the Reusable Solid Rocket Motor (RSRM) contract with ATK and the Super Lightweight External Tank contract with Lockheed Martin. Adding another flight would be possible, but costly, as numerous contracts would have to be modified and resources would have to be pulled from the Constellation program.

QUESTION 123:

If you don't have the authority to add a flight, who does -- is it only Congress?

ANSWER:

The appropriate balance among programmatic priorities across NASA, such as adding or deleting Shuttle flights, is determined as part of the Agency's budget formulation process, and reflected in the annual President's budget requests to the Congress.

QUESTION 124:

Do you have the authority to extend the sunset date? Is that only Congress?

ANSWER:

The appropriate balance among programmatic priorities across NASA, such as adding or deleting Shuttle flights, is determined as part of the Agency's budget formulation process, and reflected in the annual President's budget requests to the Congress.

QUESTION 125:

When must a final decision be made? Does there come a time when it is too late to add a mission or to extend the sunset date?

ANSWER:

Regarding the flight of AMS on the Space Shuttle, adding a Shuttle flight to the manifest before September 2010, assuming contracts could be reworked, sufficient parts could be built and the schedule would allow such a change, would cost approximately $300-400M, assuming the flight does not slip beyond 2010, and would mean accepting additional schedule and programmatic risk in the Shuttle program. If that Space Shuttle flight slipped after September 2010, maintaining the infrastructure needed to safely fly the Space Shuttle into FY 2011 would cost approximately $2.7-4.0B, and have both a significant negative impact on NASA's Constellation program and the potential of adding additional safety risks to the Space Shuttle program. NASA reported on options for flying AMS in its February 2008 report to Congress: "NASA Report to Committees on Appropriations Regarding Alpha Magnetic Spectrometer (AMS)."

QUESTION 126:

What is the status of the contingency flights? When will a decision be made whether to fly them or not?

ANSWER:

The Space Shuttle budget includes funding for the two flights, assuming they can fly safely before the end of FY 2010, but the final approval decision to fly them has not yet been made. NASA will continue to monitor the on-orbit performance of ISS hardware and systems and determine whether to launch the two contingency flights as we approach Shuttle retirement in FY 2010. The decision to fly will be based on the Shuttle's retirement timeline, and whether or not the contingency missions can be flown safely before retirement in 2010.

QUESTION 127:

If NASA were directed by a new Administration to continue to fly the Shuttle after the FY 2010 retirement date, how much would it cost to restart the manufacturing processes and continue to maintain Shuttle-unique infrastructure?

ANSWER:

Extending Space Shuttle operations beyond FY 2010 would have serious budgetary and schedule repercussions for the Constellation program. Certain contracts and subcontracts that support Shuttle are already beginning to shut down, and the cost of restarting them and continuing to support Shuttle operations beyond 2010 would cost about $2.7-4.0B per year. The substantial funding for such an approach would come out of the Constellation Program, disrupting its schedule and delaying its initial operational capability of the Orion Crew Exploration Vehicle. This strategy would end up increasing, rather than decreasing, the gap between Shuttle and Orion operations, and would delay America's return to the Moon.

QUESTION 128:

In addition to funding, are there other barriers to extending the program, such as expiring contracts and limited availability of parts?

ANSWER:

Flying the Shuttle beyond 2010 will delay the Constellation program, and only serves to exacerbate the many related challenges NASA faces with Space Shuttle retirement and transition. Major contracts and subcontracts are being terminated, which make the option of flying additional flights impractical. NASA already has contract vehicles in place to ensure that the current manifest of Space Shuttle missions is fully supported with all required consumables and spares, and the Agency has begun to modify contracts to reflect the final orders of Space Shuttle Program hardware. Recent examples of this include modifications to the Reusable Solid Rocket Motor (RSRM) contract with ATK and the Super Lightweight External Tank contract with Lockheed Martin.

The Columbia Accident Investigation Board (CAIB) recommended that "prior to operating the Shuttle beyond 2010 [NASA should] develop and conduct a vehicle recertification..." As part of its Shuttle Return to Flight process, NASA has carried out verification, and where necessary, recertification of hardware and systems to ensure safe operations through the remaining flights planned. However, if the Shuttle were to operate past 2010, NASA would need to reassess its response to the CAIB recommendation and might need to conduct additional recertification activities, which could potentially be both costly and time consuming.

QUESTION 129:

What actions can NASA take to minimize the costs of extending the remaining flight(s) into early 2011?

ANSWER:

Flying the Shuttle beyond 2010 will delay the Constellation program, and only serves to exacerbate the many related challenges NASA faces with Space Shuttle retirement and transition. The high fixed costs of operating the Space Shuttle and maintaining qualified vendors to support Shuttle production, operations, and sustaining engineering means that NASA can not maintain the option of flying the Shuttle past 2010 without severely impacting the budget available for development of the new Orion and Ares I systems under the Constellation program. NASA has estimated that these costs would total approximately $300 – 400M between now and FY 2010 to maintain these critical suppliers and other capabilities available to fly Shuttle past FY 2010, plus an additional $2.7 – 4.0B per year starting in FY 2011. if the Shuttle were to operate past 2010, NASA would need to reassess its response to the CAIB recommendation and might need to conduct additional recertification activities, which could potentially be both costly and time consuming.

QUESTION 130:

If NASA were given sufficient funds to pay for the shuttle program and build the new Constellation system at the same time, would you support continuation of the shuttle until Constellation is available, or do the safety factors inherent in the shuttle system demand that it be terminated as soon as possible, no matter how long the gap?

ANSWER:

There is no compelling mission that requires the Space Shuttle's unique capabilities after ISS assembly is complete in FY 2010. Without a compelling need, NASA does not want to fly a crewed vehicle that has no launch abort system and that might require additional recertification activities to fly after 2010. In contrast, the Ares I/Orion exploration systems are designed with a launch-abort system that helps improve the overall safety and reliability for our astronauts while enabling future missions beyond low-Earth orbit.

Keeping the Space Shuttle flying past 2010 is not a credible way to close the gap in the U.S.'s ability to launch astronauts on U.S. vehicles. NASA cannot continue flying the Space Shuttle while simultaneously and aggressively developing the next-generation Exploration systems under the Constellation program. There are two main reasons for this. First, maintaining even a minimal capability to launch two Shuttle flights per year after FY 2010 would require nearly the same infrastructure and vendor capabilities we have today, at a cost of approximately $2.7– 4.0B per year, not including the cost of potential additional recertification activities. Second, the Constellation architecture is designed to take advantage of Space Shuttle infrastructure, production capabilities, and workforce once they are no longer needed for flying the Shuttle. If the Shuttle were kept flying past 2010, these capabilities could not be released for Constellation's modification and use. As a result, keeping Shuttle flying past 2010 would only compound the problem of getting Constellation into service and exacerbate the gap in U.S. human spaceflight capabilities. It will also be extremely difficult to keep the Shuttle workforce engaged as Shuttle fly out is extended. A very dedicated workforce is needed to safely operate this complex machine. Ending on a planned date known well in advance is much easier for the workforce and planning than a floating end date.

Waiver for Post-2011 Soyuz Flights

QUESTION 131 & 132:

You have suggested that you need this waiver authority before the end of this calendar year. Why is it necessary in this timeframe? It seems to me that the new capitalists in Russia will continue to build these crew vehicles knowing that our need remains. With that in mind, does your desire to get a legislative fix before the end of the calendar year have more to do with keeping the price down as opposed to ensuring the delivery of Russian crew vehicles?

ANSWER:

The Russian ISS Program Manager has informed NASA that he requires a signed contract by October 2008 to support Soyuz services for NASA for the October 2011 crew rotation. In this timeframe, when the ISS has a crew of 6, NASA will be buying 3 seats every 6 months, which will require the Russians to build the equivalent of two additional Soyuz per year to accommodate U.S. obligations and requirements. Russia will have no need to build the additional Soyuz for its own mission requirements. Due to the lead time required for negotiation and completion of contractual actions between NASA and the Russian Federal Space Agency, a legislative solution providing further relief beyond 2011 is required by Summer 2008.

Absent the relief described above, NASA will be unable to meet one of its partner obligations, to provide crew transportation and rescue services to the European, Japanese and Canadian crews. It could also mean that the U.S. would not have an American presence, either in terms of astronauts or access to research facilities for the U.S. scientific community, onboard the ISS.

The Administration, on April 11, 2008, submitted a proposed amendment to Congress to extend the exception for payments to Russia for Soyuz crew transportation and rescue services until the Orion Crew Exploration Vehicle reaches Full Operational Capability or a U.S. commercial provider of crew transportation and rescue services demonstrates the capability to meet ISS mission requirements, and through the life of the Station for payments for Russian-unique equipment and capabilities, such as sustaining engineering and spares (for example, acquiring Russian equipment for use in training in the United States, and hardware, such as spares, to outfit the Russian-built, but U.S.-owned, Zarya module). We look forward to working with the Congress on enactment of this crucial legislation.

QUESTION 133:

When will the Administration submit a formal legislative waiver authority? What's the hold up?

ANSWER:

NASA appreciates that Congress will require time to consider any request to amend the Iran, North Korea, and Syria Nonproliferation Act (INKSNA) to enable the Agency to purchase Russian services beyond 2011.. The Administration recently submitted a proposed amendment to Congress to extend the exception for payments to Russia for Soyuz crew transportation and rescue services until the Orion Crew Exploration Vehicle reaches Full Operational Capability or a U.S. commercial provider of crew transportation and rescue services demonstrates the capability to meet ISS mission requirements, and through the life of the Station for payments for Russian-unique equipment and capabilities, such as sustaining engineering and spares (for example, acquiring Russian equipment for use in training in the U.S., and hardware, such as spares, to outfit the Russian-built, but U.S.-owned, Zarya module). We look forward to working with the Congress on enactment of this crucial legislation.

QUESTION 134:

If NASA is so concerned about the gap in human space flight, why would it not simply chose to extend the Shuttle program?

ANSWER:

First, flying the Shuttle beyond 2010 will delay the Constellation program, and only serves to exacerbate the many related challenges NASA faces with Space Shuttle retirement and transition. The Space Shuttle is an extremely capable but expensive system to operate, with annual fixed costs of $2.7 – 4 billion per year, not including the cost of potential additional recertification activities. Given these high costs, continuing to operate the Space Shuttle beyond 2010 would only exacerbate the gap between Shuttle and Orion.

Second, major contracts and subcontracts are being terminated which make the option of flying additional flights impractical. The basic assembly sequence is ordered in a manner that flies the technically required flights first and then flies the International Partner elements in the order negotiated with all partners.

Third, it is difficult to retain the focus necessary from the workforce to fly safely for multiple years with an uncertain future. Today, NASA knows how many flights remain and the time period involved, so the Agency can concentrate its efforts and remain focused for this fixed period. If Shuttle is extended beyond 2010 with an uncertain end, it will be extremely difficult to retain the personnel necessary to manage the closeout and fly safely.

Fourth, flying beyond 2010 will no longer require the unique capabilities of the Shuttle, and will no longer justify the risk of flying a complicated vehicle such as the Shuttle. Prior to 2010, the focus is on assembling the International Space Station and outfitting it for research and sustained operations. This period requires the unique capabilities of the Shuttle and warrants the complexity and risk of Shuttle flights. Beyond 2010, the primary focus would be crew transportation and logistic and scientific resupply. This does not require the unique capabilities of the Shuttle and can be performed simpler, less complicated and with a less expensive transportation systems.

QUESTION 135:

In your judgment, in considering the legislative waiver, should the Congress view the request in solely programmatic terms or as a matter of foreign policy?

ANSWER:

While NASA would not presume to tell Congress how to bound its deliberations concerning the possible amendment of laws, INKSNA is clearly a very important foreign policy tool designed to address a matter of great concern to all Americans. Amending INKSNA has ramifications beyond the Agency's programmatic needs. NASA is hopeful that an appropriate balance can be struck whereby U.S. national interests can be balanced, resulting in both the realization of our nonproliferation goals and the continued presence of U.S. astronauts on the International Space Station between the retirement of the Space Shuttle in FY 2010 and the full operational capability of the Orion Crew Exploration Vehicle in 2016.

QUESTION 136:

What is the estimated cost of procuring these services from the Russians? Does this estimate recognize your most recent experiences and price growth of ten fold for research on the station?

ANSWER:

We do not understand the context of the proposition that there has been a "price growth of ten fold for research on the station". The NASA funded research program, which is largely focused on biomedical research to ensure human health and performance on long duration space missions, has not experienced any cost increases of this magnitude. In the case of emerging research projects under the National Laboratory initiative, our findings are quite the contrary. Most of the interest we have found to date is in the area of biotechnology where contemporary research objectives principally involve cellular and molecular level experimentation. These investigations are typically highly automated and relatively small in terms of mass (e.g., 5-10 kilograms/experiment). In addition, NASA and our prior research partners have already developed multipurpose payload equipment necessary to conduct this research. As a result, the future cost of doing biotechnology research in space, which is the area that appears most in demand, is actually decreasing. While future transportation costs in the post-Space Shuttle time frame remain largely speculative, we remain confident that the reduction in experiment size will offset any increases.

Shuttle Transition and Retirement Costs

According to NASA, no funding has been provided after 2010 for phasing out the Shuttle even though NASA expects that it will take several years to wind the program down, including final disposition of facilities and equipment, closing out contracts, workforce transition, and to make the transition to the new Orion/Ares system.

QUESTION 137:

If Shuttle transition costs are not included in the budget after from 2010, where will the funds be derived to pay for these costs – science or exploration, for example?

ANSWER:

Exploration Systems will be the primary Agency funding source for human space flight activities post-2010. Although currently carried as a threat with a Not to Exceed Target of $350M in this year's budget process, the Constellation program is notionally prepared to accept a threshold cost of $450M that will come from program reserves. However, the goal is to keep these costs to an absolute minimum as part of this year's FY 2010 budget formulation process, since any costs greater than this amount could have an adverse impact on the proposed Initial Operational Capability date of March 2015.

QUESTION 138:

How likely is it that Shuttle transition costs might significantly delay or otherwise impact currently planned and budgeted programs?

ANSWER:

The specific impact is still being assessed. However, in general, the FY 2010 budget cycle will produce the most detailed and accurate Transition and Retirement estimate to date, which is expected to be less than previous estimates, given the increased maturity of requirements, more clearly defined process guidelines, and better overall understanding of the type and scope of work to be accomplished. In turn, this will provide good insight into the specific programmatic impact of Transition costs. As part of NASA's current FY 2010 budget formulation now underway, the Constellation program will evaluate estimated costs and determine the best strategy for budget adoption. Although currently carried as a threat, the Constellation program is notionally prepared to accept a threshold cost of $450M that will come from program reserves after FY 2010. However, the goal is to keep these costs to an absolute minimum, since any costs greater than this amount could have an adverse impact on the proposed Initial Operational Capability date of March 2015.

QUESTION 139:

Why would you not incorporate a "budget wedge" in your outyear budgets to serve as a place holder for transition costs?

ANSWER:

NASA will include a budget line for Transition in the FY 2010 budget as a result of the maturity of the transition costs that will be evident at that time. NASA's goal is to keep these costs as low as possible. A premature budget for this activity would have over-estimated the costs NASA believes it can achieve. The FY 2010 Planning, Programming, Budgeting and Execution (PPBE) process will produce the most detailed and accurate Transition and Retirement estimate to date, which is expected to be less than previous estimates given the increased maturity of requirements, more clearly defined process guidelines, and better overall understanding of the type and scope of work to be accomplished. Existing Shuttle Retirement and Transition costs have been generated as part of the FY 2009 PPBE process; however, due to the aforementioned reasons; NASA has not yet adopted them in a budget line. Given the substantial annual decrease in projected costs and this positive trend, it has been in the best interest of both NASA and the taxpayers to defer adoption of a transition and retirement budget post-2010 until this year.

QUESTION 140:

How much has NASA already spent on Shuttle transition/termination costs to date? How have those expenses been paid?

ANSWER:

Through FY 2007, the Space Shuttle Program has spent approximately $26M for Transition and Retirement costs. An additional $60M is planned for FY 2008.

QUESTION 141:

Presumably, such costs have been paid out of the program lines (which previously included indirect costs) since we have not provided specific appropriations for such activities. That suggests that funds provided within the project lines have been in excess to specified requirements. That being said, are the funds requested now in cross-agency padded? Are the business lines still in excess of need?

ANSWER:

NASA programs are required to account for decommissioning (otherwise known as Phase F) as part of the standard program process. Shuttle transition and retirement activities have been funded out of the Shuttle program budget line consistent with normal Phase F planning activities and established Agency program planning requirements. NASA is working a number of options to reduce the cost threat of Shuttle transition and retirement and will provide updated estimates with the President's FY 2010 budget submit.

NASA has been saying in several of the last budgets that the next budget would contain defined content and cost estimates. Again, the FY 09 budget contains no cost estimates, yet last week NASA issued a draft programmatic environmental assessment on potential impacts resulting from the Space Shuttle Program's move toward retirement in 2010 and its transition to the Constellation Program.

The assessment concludes that, due to the use of shuttle components and facilities by the Constellation Program, potential environmental impacts from disposing of the Shuttle program's real and personal property would be "minimal" to "moderate", depending on the property disposition method. The study also assesses the social and economic influence of the shuttle program on the regions around NASA's major centers. Analysis shows that the contribution of the shuttle program is relatively modest in proportion to the overall economic activity of the regions, less than one percent, except in the Kennedy Space Center, Fla., region, where it is less than three percent. Clearly, NASA is nearing retirement and transition cost estimates with greater degree of confidence.

NOTE: Most of the issues covered in questions 142-152 are addressed in NASA's *Workforce Transition Strategy – Initial Report*, which was released to the Committees on Appropriations, in accordance with direction in the *Consolidated Appropriations Act of 2008*, in late March.

QUESTION 142:

Dr. Griffin, do you care to give the Committee an estimate of retirement and transition costs that reflect some confidence now? What's your hesitancy?

ANSWER:

NASA's FY 2006-2010 Transition and Retirement (T&R) costs are budgeted for in the Space Shuttle Program line, and total $367M. In 2007, NASA projected T&R costs of $1.2B for the outyears (FY 2011-2015). The increasing maturity of the Agency's understanding of Constellation Program requirements is helping improve the fidelity of our projections. NASA is currently generating updated data in support of this year's budget formulation process; these data are being developed with the benefit of trade studies and "what-if" exercises conducted since last year's budget was built. The Agency does not want to commit to a firm set of outyear numbers at this time, since data and trends indicate that T&R costs will be *lower* than our most recent full estimate from 2007. NASA is trying not to lock in higher figures so people will continue to be incentivized to find the best methods and approaches for the Agency. In preparing for this year's budget formulation process, lean target costs for FY 2011-2015 were established to clearly communicate the desire to minimize this expense, as projects update their estimates this year. The actual outyear plan will be set after reviewing updated costs for each task, determining which tasks are mandatory, calculating the cost/benefit ratio of discretionary tasks, and verifying that each task implementation method is reasonable, efficient and provides the lowest cost option to the Agency.

QUESTION 143:

Two and a half years after the release of the Exploration Systems Architecture Study report, can you now say what the impact will be of Shuttle retirement and the gap in human spaceflight capability to the KSC and JSC areas?

ANSWER:

Please refer to the *Workforce Transition Strategy – Initial Report*, noted above, as well as the *Draft Space Shuttle Program Programmatic Environmental Assessment*, which can be found at: "http://www.nasa.gov/mission_pages/shuttle/main/pea.html" for information about various impacts of NASA's T&R activities on the affected Centers.

QUESTION 144:

How many people are going to lose their jobs?

ANSWER:

NASA's current workforce projections associated with T&R activities can be found in the *Workforce Transition Strategy – Initial Report*, noted above. The report provides estimated workforce level ranges at each of the affected Centers. These projections will be revised as NASA's estimates become further refined; the *Workforce Transition Strategy* report will be updated every six months, in accordance with direction in the *Consolidated Appropriations Act of 2008*.

QUESTION 145:

Are the Space Shuttle contractor reductions in FY 2009 and FY 2010 in addition to the oft-cited 4,000 reductions in contractors at KSC in FY 2010 after the Space Shuttle retires?

ANSWER:

NASA's current workforce projections associated with T&R activities can be found in the *Workforce Transition Strategy – Initial Report*, noted above. The report provides estimated workforce level ranges at each of the affected Centers. These projections will be revised as NASA's estimates become further refined; the *Workforce Transition Strategy* report will be updated every six months, in accordance with direction in the *Consolidated Appropriations Act of 2008*.

QUESTION 146:

Why is the economic impact from the Space Shuttle Program Environmental Assessment so low for the KSC area?

ANSWER:

The breadth of economic activity in the areas around NASA's major Centers has increased and diversified over the past decades. The Space Shuttle program accounts for 2.4 percent of the total economic output of the Central Florida economy. In areas where civil servants and contractors are highly concentrated, such as Brevard County in Florida, which hosts more than 78 percent of the KSC Shuttle workforce, the total economic impact of the Shuttle program can be as high as approximately 4 – 4.5 percent of the total economic activity. NASA recognizes the unique role that the Space Shuttle Program plays in local area economies as a source of high skilled, high pay jobs, not to mention the deep roots that space exploration has in local communities.

Economic activity does not stop at town or county borders; it is a regional phenomenon that involves the suppliers of the goods and services procured or consumed by NASA and its employees and their families. (This is the concept of the "multiplier effect" discussed in section 4.1.2.1. of the NEPA report.) The economic regions of influence for the purposes of modeling indirect/induced economic activity were defined based on the residence patterns of NASA civil service and onsite contractor employees; it reflects the region in which those employees shop, own property, and pay taxes. If smaller areas were modeled, the input-output multipliers also would be smaller (because local economic activity is typically less complex), producing a lower estimate of total output.

QUESTION 147:

How much will severance and retirement cost?

ANSWER:

NASA is in the process of building its Space Shuttle Program Severance and Retention budget as part of its larger Transition and Retirement activities. The eventual cost of this effort will be dependent on the degree to which the Agency and its industrial partners are able to provide workers with employment opportunities in the new Constellation Program, and/or train them for work elsewhere in NASA. Details of some of these initiatives are provided in the *Workforce Transition Strategy – Initial Report*, noted above.

QUESTION 148:

What is NASA doing to help people who will not have a job once the Shuttle is retired?

ANSWER:

NASA and its industry partners are working to provide a clear career path to challenging and exciting follow-on work in the Constellation Program and on other programs, maintain NASA's quality workplace by providing a collaborative and creative environment, and support career development and learning opportunities.

NASA is committed to transitioning as much of the Space Shuttle civil service workforce to other Agency programs as is practical and necessary using tools such as workforce synergy, matrixing, detailing, and retraining. In addition, NASA Centers are identifying opportunities for the placement of employees with needed skills in other organizations. The Agency's industry partners have a range of transition, retention, and staffing tools available to assist employees during transition, as well.

NASA has provided the Space Shuttle prime contractors with a number of opportunities to help safely manage the Shuttle operations through FY 2010 and to prepare the contractor workforce for Shuttle retirement. This includes opportunities for employees to do work on several different NASA programs, skills retraining, and in selected cases, severance and retention bonuses. NASA remains committed to working with its industry, supplier, and research partners to craft and implement strategies to minimize disruption, upheaval, and economic impact, while maximizing support vital for Shuttle missions and program requirements.

For further information, please refer to the *Workforce Transition Strategy – Initial Report*, noted above.

QUESTION 149:

Are there morale issues developing as a result of the Shuttle retirement, especially with those contractors that do not have a broad business base?

ANSWER:

Morale among Space Shuttle Program workers is good, with the majority electing to remain with the program through Shuttle retirement. NASA and industry surveys identified employee focus on future meaningful work (e.g., opportunities in the Constellation Program) as the prime incentive to stay with Shuttle through fly-out. Perceptions of future work opportunities are dependent on employee age, geographic location, and the employer's role in Constellation (if known, at this time). NASA recognizes that the retention challenge is more manageable for companies with a clear role in supporting Constellation, and for companies with a broad business base; these contractors can migrate workforce to support Constellation or other company business as the Shuttle approaches retirement. The challenges are greater for those companies whose work is exclusively Shuttle-based. NASA continues to work with its industry partners to address these issues and provide new opportunities to key workforce in the post-Shuttle environment for employees.

QUESTION 150:

How is NASA assessing the appropriate numbers and mix of skilled workers needed to safely fly the Shuttle through 2010 and to transition from Shuttle to (CEV) crew exploration vehicle?

ANSWER:

NASA is committed to ensuring that the remaining Shuttle missions are flown safely -- and the assembly of the International Space Station is completed -- by the end of FY 2010. In addition, the Agency is working towards an Initial Operational Capability for the Orion Crew Exploration Vehicle (CEV) in March of 2015. The Space Operations and Exploration Systems mission directorates are working together to ensure that the retirement of Shuttle and the ramp-up to Orion are accomplished as smoothly as possible. This effort includes joint transition initiatives that aim to optimize the mix of workers involved in each program at any given point in time, including matrixing and cross-training employees so they can utilize their current skills to support both programs while learning new skills that can be migrated to the new Constellation Program.

For further information, please refer to the *Workforce Transition Strategy – Initial Report*, mentioned above, and the three key documents that form the foundation for the Agency's workforce transition strategy:

- *NASA Workforce Strategy*, 2006
  "http://nasapeople.nasa.gov/HCM/WorkforceStrategy.pdf"

- *NASA Human Capital Plan for Mission Execution, Transition, and Retirement of the Space Shuttle Program*, 2006
  "www.nasa.gov/pdf/218792main_SSP_human_capital_plan.pdf"

- *NASA Human Space Flight Transition Plan* (currently being updated as the *NASA Transition Plan, 2008*).
  "http://spaceoperations.nasa.gov/tran_plan.pdf)"

QUESTION 151:

Will the transition result in NASA losing in-house technical capabilities, risking future space flight operations?

ANSWER:

NASA's most critical resource, and the one which will be most valuable to the Constellation Program, is the highly skilled workforce that will turn the Nation's space exploration policy into a reality. Today, a large portion of the Agency's skilled civil servant and contractor workforce is focused on the safety of ongoing mission operations. The experience and expertise within this workforce is required for the Constellation program to succeed. NASA's human space flight workforce will shift from being focused primarily on operating spacecraft to a recurring cycle of spacecraft development and operations. NASA recognizes and values the dedication of its Space Shuttle workforce and will leverage this resource by engaging those men and women in challenging future work that capitalizes on their unique skills and abilities to the maximum extent practical.

QUESTION 152:

What NASA facilities are most affected by the disposition of ground infrastructure?

ANSWER:

The NASA facilities most likely to be affected by the disposition of Space Shuttle Program ground infrastructure are the Kennedy Space Center (KSC), Michoud Assembly Facility (MAF), and the Marshall Space Flight Center (MSFC). The Agency is working to determine which ground infrastructure elements can be migrated to the Constellation Program in whole or in part, and which will be disposed of by other means. While many of NASA's assets at the impacted Centers will be usable by the Constellation Program, in the case of those to be disposed of, NASA is examining recent Department of Defense efforts to "deconstruct," rather than demolish, facilities that have been excessed. Deconstruction involves dismantling obsolete facilities in such a way that many of their constituent components can be recycled for other uses. This has been shown to significantly offset the cost of facility disposal, and of course, provides raw materials for other assets.

Legislative Provision Relating to the Close Out of Space Shuttle Contracts

QUESTION 153 & 154:

The budget includes a legislative proposal that would allow NASA to disburse funds obligated between FYs 2001 through 2009 for the purpose of liquidating obligations related to the close out of Space Shuttle contracts.

> "For closeout of all Space Shuttle contracts and associated programs, sums in Human Space Flight, Space Flight Capabilities, and Exploration Capabilities appropriation accounts expiring in 2003 or later are to remain available through 2015 for the disbursement of termination costs." IBPD page App-3

Can you please describe the need and effect of the legislative proposal in greater detail?

When must this legislation be enacted? What is the effect if this authorizing legislation is not enacted this fiscal year?

ANSWER:

The Shuttle program has been a very long and complex program, with many multi-year contracts. With Shuttle retirement in 2010, NASA will begin final closeout activities on the Shuttle contracts. As we proceed through a methodical auditing and closeout of the contracts, it is common to identify upward and downward adjustments that need to be made to the value of the contract activities, due to final audits of overhead rates and closeout of subcontracts. Shuttle has major contracts that may see rate adjustments going back as early as 1997-2004, as those were the last times rates were settled with the contractors. These adjustments are permitted to take advantage of any expired but un-obligated budget authority from those original fiscal years.

Currently funds expiring in FY 2003 or later have not been cancelled, and are available for adjustments to the contract values in those specific fiscal years. Once the funds are cancelled (5 years after expiration), current year appropriations must be used for these adjustments. Since there will be no current Shuttle budget, this means a reduction to other current programs is required to accommodate these adjustments.

To avoid impacts to other current programs, this legislative provision would enable NASA to postpone cancellation of these Shuttle funds until FY 2015, to permit their use for any upward adjustment of the original obligations from those fiscal years. Postponing cancellation permits the use of the original authority, which currently represents about $33M in total for FY 2003-2006. These funds could not be used for any new obligations, and could only be used to cover adjustments to the original obligations made in those years.

If this legislative provision is not enacted in FY 2009, then FY 2003 funds will have cancelled, and approximately $13M in authority will not be available for any FY 2003 adjustments. These adjustments would then be made from current program funds.

Note: In coordination with the Congressional Budget Office, the Office of Management and Budget has updated this provision, in letter sent to the Committees on Appropriations on February 15, 2008, as follows, to clarify that this provision does not increase the budget authority of the Agency, and that NASA is not permitted to re-obligate the funds:

> *For the closeout of all Space Shuttle contracts and associated programs, amounts that have expired but have not been cancelled in the Human Space Flight, Space Flight Capabilities, and Exploration Capabilities appropriations accounts shall remain available through fiscal year 2015 for the liquidation of valid obligations incurred during the period of fiscal year 2001 through fiscal year 2009.*

QUESTION 155:

Why was this authority requested as appropriations language rather than in NASA's reauthorization package needed this year?

ANSWER:

This provision was requested as an Appropriations administrative provision based on the fact that it would modify the availability of prior-year appropriations.

QUESTION 156:

What is NASA doing today to implement these strategies?

ANSWER:

NASA continues to encourage the development of commercial service providers through the COTS effort, and has recently posted an International Space Station (ISS) Resupply Draft RFP (DRFP) on line at: "http://procurement.nasa.gov/cgi-bin/eps/sol.cgi?acqid=128918#Draft%20Document". This site also features the cover letter for the DRFP, which summarizes what NASA is looking for to help the Agency achieve the goal of procuring reliable, safe, and cost effective cargo delivery to the ISS.

In the case of crew transport, NASA is working towards an Initial Operational Capability (IOC) for the Orion Crew Exploration Vehicle of March 2015, with a full operational capability (i.e., one that could support crew transport to the Space Station) about a year later, in 2016.

For the period immediately following the retirement of the Space Shuttle in FY 2010, NASA is seeking relief from the provisions of the Iran, North Korea, and Syria Nonproliferation Act (INKSNA). NASA recently submitted a proposed amendment to Congress to extend the exception for payments to Russia for Soyuz crew transportation and rescue services until the Orion Crew Exploration Vehicle reaches Full Operational Capability or a U.S. commercial provider of crew transportation and rescue services demonstrates the capability to meet ISS mission requirements, and through the life of the Station for payments for Russian-unique equipment and capabilities, such as sustaining engineering and spares (for example, acquiring Russian equipment for use in training in the U.S., and hardware, such as spares, to outfit the Russian-built, but U.S.-owned, Zarya module). We look forward to working with the Congress on enactment of this legislation which is crucial to the future of the Space Station.

QUESTION 157:

Previously NASA has identified a potential shortfall of 40 metric tons from FYs 2010 and 2015, not including the upmass required for the National Laboratory. Has NASA's estimate of the potential shortfall changed this past year?

ANSWER:

The estimated potential upmass shortfall to the Station (excluding National Laboratory upmass requirements) has not changed; it remains 40 metric tons from FY 2010-2015.

QUESTION 158:

What is the additional upmass needed for the National Laboratory?

ANSWER:

The upmass required to support the use of ISS as a National Laboratory is about 3.1 Metric tons per year from FY 2010 through FY 2013 (the end of the budget horizon for the President's FY 2009 budget request); the number rises to 3.2 Metric tons in FY 2012.

QUESTION 159:

What are the consequences on the ISS and the National Laboratory if this gap is not reduced?

ANSWER:

NASA is working to ensure that it has the amount of upmass and downmass capacity required. If the amount is insufficient, it will mean that the capabilities of the Space Station will not be fully utilized, and some research intended to support the Agency's Exploration program, as well as non-Exploration work associated with the National Laboratory, may be delayed. NASA is funding the Commercial Orbital Transportation Services (COTS) effort to encourage the development of commercial cargo service providers, and has recently issued a draft RFP for Space Station resupply (please see response to Question #156, above).

ISS Utilization

QUESTION 160:

How long will NASA need the ISS to get all needed data for its human space exploration program?

ANSWER:

By 2016, NASA will have quantified the risks to humans on Mars missions and have a suite of countermeasures identified, with some of them flight validated. Validation of the full set of countermeasures might require several more years of research. Operating the ISS beyond 2016 is a decision that must be made by future Administrations and Congresses. Thus, while NASA is taking no action to preclude ISS operations beyond that point, the Agency's current outyear budget plans do not include funding to operate the ISS beyond 2016. Future decisions on the end-date for ISS operations will be based on discussions with the ISS international partners, progress toward the President's Exploration goals, and the affordability of projected ISS operations costs.

The International Space Station is the in-space laboratory that enables critical biomedical research to be conducted involving crewmembers to secure knowledge, test countermeasures, and evaluate technologies important for the development and validation of risk mitigation techniques for exploration missions. NASA's Human Research Program (HRP) goal is to provide human health and performance countermeasures, knowledge, technologies, and tools to enable safe, reliable, and productive human space exploration. To meet that goal, HRP has analyzed the value and necessity of the International Space Station (ISS) to quantify the human health and performance risks for crews during exploration missions. These risks are discussed in detail in the Human Research Program Requirements Document:

http://humanresearch.jsc.nasa.gov/files/hrp-47052_HRP-Req-Doc.pdf

Based on this set of exploration risks, the Human Research Program has defined a research and technology plan to address the risks. In summary, this plan is by 2016:

- to perform the research needed to identify and quantify risks to human health and performance
- to identify potential countermeasures
- to flight validate some of those countermeasures

QUESTION 161:

How have you arrived at that date?

ANSWER:

NASA's Human Research Program (HRP) has developed its research plan based on a risk management approach to assess human health risks associated with the planned architecture for exploration missions. By analyzing the gaps in knowledge, technology, and countermeasures where research is required to fully understand or mitigate the risk, HRP identified the core research requiring the ISS platform. This core ISS research requirement was integrated with the available ISS resources, anticipated number of ISS biomedical research subjects, and ISS facilities resulting in an ISS Utilization Plan to inform decisions on the mitigation, acceptance or retirement of the risks associated with exploration missions through 2016.

In the ISS Utilization Plan for HRP, the research plan for various risks is laid out as a progression of activities that are designed to address critical questions that must be answered to quantify the risk or develop mitigation strategies for the risk. The activities on ISS are essential for two reasons. First, because there is no effective ground-based analog to conduct the work, or secondly, the research activity needs the complete operational environment of space flight to validate the countermeasure or technology. The ISS is necessary to address 25 of the 32 human health risks anticipated on exploration missions. Only those risks that require the ISS are described in the NASA ISS Utilization Plan. The Utilization Plan describes the risk, associated activities, and schedule that require use of the International Space Station.

Finally, recognizing that research is inherently unpredictable, it would be impractical to assume a linear approach with respect to future research plans. As NASA gains knowledge from ISS research, the required research approaches and timelines will change. As a result, the NASA ISS Utilization Plan will be revised and updated based on consideration of new evidence gained, available resources, Constellation needs, and other driving schedule constraints.

QUESTION 162:

What actions have NASA taken to date that would preclude the use of the ISS after 2016?

ANSWER:

NASA has taken no actions to preclude the use of the Space Station after 2016; decisions regarding the continued operations of the ISS after that time will be taken by future Administrations and Congresses.

QUESTION 163:

Why does NASA continue to be coy about its usage of the Station after 2010 and how has it affected our international partners?

ANSWER:

NASA has acknowledged the gap between the retirement of the Shuttle at the end of FY 2010 and the advent of the Orion Crew Exploration Vehicle, as well as the upmass shortfall after Shuttle retires. Per previous statements, the Agency is working to address these issues though an array of strategies, including the development of commercial providers, efforts to keep the Constellation Program on schedule, and is seeking relief from the prohibitions of the Iran, North Korea, and Syria Nonproliferation Act against buying Russian services in the wake of Shuttle retirement.

Regarding the termination of U.S. funding for Station operations and research after 2016, this date -- which is beyond the current budget horizon of FY 2013 -- is based on the 15-year certification duration of U.S. Station components. Operating the ISS beyond 2016 is a decision that must be made by future Administrations and Congresses. Thus, while NASA's current outyear budget plans do not include funding to operate the ISS beyond 2016, the Agency is taking no action to preclude ISS operations beyond 2016. Future decisions on the end-date for ISS operations will be based on discussions with the ISS international partners, progress toward the President's Exploration goals, and the affordability of projected ISS operations costs.

Alpha Magnetic Spectrometer (AMS)

QUESTION 164:

How much would it cost to add another shuttle launch to the current schedule?

ANSWER:

Adding an additional Space Shuttle flight to the manifest before September 2010, assuming contracts could be reworked, sufficient parts could be built and the schedule would allow such a change, would cost approximately $300-400 million and would mean accepting additional schedule and programmatic risk in the Shuttle program. If the flight slipped beyond September 2010, the cost would be much higher, since NASA would be unable to shut down Shuttle capabilities as planned. Adding an additional Space Shuttle flight to the manifest after September 2010 and maintaining the infrastructure needed to safely fly the Space Shuttle into FY 2011 would cost approximately $2.7-4 billion, not including the cost of potential recertification activites, and have both a significant negative impact on NASA's exploration program and the potential of adding additional safety risks to the Space Shuttle program.

QUESTION 165:

What are the most important criteria in determining whether or not to add another flight to the schedule for this mission?

ANSWER:

After the Columbia tragedy of 2003, the number of NASA's Shuttle flights was reduced and the focus placed on completing the assembly of the International Space Station and retiring the Shuttle. At this point, adding a flight to the Shuttle manifest would cost a minimum of $300-400M (see above) and increase schedule and programmatic risk in the Shuttle and Constellation programs.

QUESTION 166:

One of the reasons that the United States is committed to completing the construction of the space station is to fulfill our commitments to the international partners in the program. Does that same philosophy apply to the AMS, which also was built by an international consortium, with the promise that NASA would deliver it to the space station?

ANSWER:

The AMS science experiment was selected by the U.S. Department of Energy (DOE) Office of Science in 1995. DOE is the sponsor of the 16-nation AMS International Collaboration that is responsible for AMS experiment development and testing. NASA signed a 10-year Implementing Arrangement (IA) with DOE in 1995, agreeing to integrate and launch AMS on the Space Shuttle twice: first, on a science and engineering test flight which was successfully accomplished on STS-91 in 1998, and second, to the International Space Station (ISS) to be installed as an externally attached payload. In the aftermath of Columbia and with the 2005 expiration of the AMS IA, DOE was notified that NASA would not be able to launch AMS on the Space Shuttle to the ISS due to technical and schedule constraints associated with the critical support of the ISS. NASA notified DOE subsequently that NASA AMS Shuttle/ISS integration activities would continue as long as these activities remained viable.

QUESTION 167:

What are the pros and cons of putting AMS on one of the currently planned logistics flights instead of other cargo, and launching the other cargo on an ELV, perhaps one being developed under the COTS program?

ANSWER:

NASA has looked at multiple options for flying AMS on the Shuttle, carefully evaluating a variety if suggestions and looking creatively for any options to fly AMS on the remaining assembly and logistics flights. If schedule allows for contingency flights to fly before 2010, it appears that the ULF-5 contingency flight would experience the fewest impacts from accommodating AMS. However, doing so would remove upmass capability that would pose challenges to the long-term viability of ISS. Specifically, EXPRESS Logistics Carrier (ELC) #4 would be removed. ELC #4 carries the fourth high pressure oxygen tank to support ISS spacewalks, a battery charge/discharge unit, an S-Band antenna support assembly, and a spare robot arm for the Canadian Special Purpose Dextrous Manipulator (Dextre, recently delivered to ISS by STS-123). The need for this hardware could be time-critical and some of the hardware would not fit on another launch vehicle without redesign (e.g., the high pressure O2 tank). While NASA anticipates that the COTS effort may result in several commercial vendors in the future, their systems may not reachoperational maturity in time to support the migration of Station spares onto the new vehicles.

The Agency examined re-manifesting a combination of three candidate flights to accommodate AMS, but none of the options proved feasible. Until NASA better understands the performance of ISS systems and gains further experience in operating the new systems on the Station, adding additional risk to the viability of ISS by replacing critical hardware with AMS is not prudent. Flying AMS, only to be unable to operate it due to of degraded ISS systems, is not a good plan. Flying and operating ISS is one of the most complicated tasks that NASA has ever attempted, and the Agency requires margin in order to be successful.

National Laboratory

QUESTION 168:

What are the highlights of the scientific research that has been conducted in the Destiny module for the past 7 years?

ANSWER:

Examples of some of the recent experiments utilizing the ISS have resulted in:

- Understanding renal stone formation due to bone loss;
- Understanding microbial adaptation to space flight;
- Understanding the relationship between loss of bone density and bone strength;
- Gaining greater insight into the nature of individual variability and susceptibility to radiation damage;
- Quantifying particulate fire signatures in microgravity; and,
- Investigating the role of capillary forces in the transport and storage of fluid systems in space

A complete list of publications resulting from activities on ISS can be found at: http://iss-science.jsc.nasa.gov/publications.cfm#results)

The ISS is primarily utilized to:

1) Conduct research pertinent to the goals of the human research program;
2) Conduct research on gravitationally-dependent phenomena in physical sciences; and,
3) Serve as a test bed for technology development and demonstration.

1) Conduct research pertinent to the goals of the human research program

NASA uses the ISS as a long-duration space biomedical laboratory to reduce spaceflight risks to humans and focus on the highest risks to crew health and performance for exploration missions. It also serves as a test bed for development and validation of medical technologies and procedures that will be needed to enable future exploration missions.

Significant progress has been made to understand and mitigate the deleterious effects of space on human beings with respect to Bone and Muscle physiology; Cardiovascular & Respiratory Systems; Human Behavior and Performance; Immune System changes; Integrated Physiology; Neurological and Vestibular Systems and Radiation Environment.

This research will form the basis to develop and test countermeasures for health issues such as renal stone formation, assessment of nutritional status during long duration spaceflight. This research also helps in assessing Crew behavior, performance, and group interactions under an operational spaceflight environment. We will be able to develop and validate exercise and nutritional countermeasures to prevent bone and muscle loss, and to provide critical aspects of clinical care in remote setting of space flight which remains an ongoing challenge for medical operations. Measurements on ISS have provided data on tissue shielding to improve the prediction of radiation risk.

A comprehensive list of the experiments and payloads associated with human research and countermeasure development for space along with the research details, applications and results can be found at: http://iss-science.jsc.nasa.gov/cat_list.cfm

2) Conduct research on gravitationally-dependent phenomena in physical sciences

NASA uses the ISS as a platform to conduct research on gravitationally-dependent phenomena in physical sciences, i. e., combustion science, fluid physics and materials science.

Experiments in combustion science have yielded data on the particulate environment of the ISS as well as demonstrated the use of commercially available particulate counters in a microgravity environment. Experiments have also been conducted to quantify the particulate fire signatures in microgravity by measuring various properties of smoke particulate distributions from typical spacecraft materials in microgravity which will aid in the design of advanced fire particulate/smoke detectors for exploration vehicles and habitats. Fluid physics experiments have focused on: the growth, dynamics, and physical properties of different classes of colloids; examination of viscoelastic mechanisms and states of magnetorheological (MR) fluids; dynamics of phase separation when the making effects of gravity; and role of capillary forces in the transport and storage of fluid systems in space. The focus of Materials Science experiments has been on coarsening processes in alloys, directional solidification, measurement of thermophysical properties in the context of crystal growth and developing techniques to measure viscosity of liquids under containerless conditions.

A comprehensive list of the experiments and payloads associated with physical sciences experiments along with the research details, applications and results can be found at http://iss-science.jsc.nasa.gov/cat_list.cfm

3) Test bed for technology development and demonstration.
The ISS is also used as a technology validation test bed to gain experienced on new technology concepts pertinent to life support and environmental monitoring. Examples of environmental monitoring technologies include an event monitor to detect trace contaminants (Electronic Nose) and an instrument called the Vehicle Cabin Atmosphere Monitor which is a Gas Chromatograph- Mass Spectrometer.

Details of these instruments can be found at http://iss-science.jsc.nasa.gov/cat_list.cfm

QUESTION 169:

Scientific utilization is sometimes measured in the number of space station crew hours devoted to scientific research. How many crew hours are devoted to science today?

ANSWER:

During the assembly phase, the crew's priority is on assembly operations. This is essential in order achieve completion by the end of FY 2010 when the Space Shuttle is retired. In addition, the limited crew of three must operate and maintain the growing spacecraft. As a result, crew time available for ISS research during this construction-intensive phase has varied depending on the scope of assembly and maintenance tasks during each increment. It should be noted that many physical sciences experiments are classified as "reserve" payloads; NASA also relies on the ISS crew devoting "voluntary science" time to accomplish many of these experiment operations. The hard work and diligence of the ISS crews has helped achieve the completion of many science experiments which were beyond the scheduled crew time for science. This was particularly true on Increments 14, 15 and 16.

In 2009, the ISS partnership plans to increase the crew size from three to six, as was originally planned, in order to prepare for the post-assembly utilization phase. In accordance with the international Memoranda of Understanding, during the full-up utilization phase, three of the available crew will be dedicated to U.S., European, Japanese and Canadian objectives. During this period, it is estimated that approximately one crew person equivalent (~ 35 hrs/week) will be dedicated to such research operations. In practice, ISS crew consistently demonstrated a willingness, and indeed eagerness, to devote additional un-scheduled time to research tasks. It is anticipated that this dedication to mission will continue in the post-assembly utilization phase of the ISS.

It is also important to note that the "number of space station crew hours devoted to scientific research" is not always the best indicator of research productivity. As research interests have evolved, investigators have also noted that higher degrees of automation and lower re-supply requirements are a competitive edge in selection. Consequently, crew time and experiment re-supply requirements have been declining while maintaining the quality of research.

QUESTION 170:

How is that expected to grow over the next year as the European and Japanese labs come into use?

ANSWER:

As the European *Columbus* and Japanese *Kibo* laboratories come "on-line" in FY 2008, requirements for crew time to both operate and maintain the system and productively utilize the labs will also grow. It was precisely for this reason that the ISS Program planned growth from three to six crew during the final stages of assembly. This plan remains on schedule and the crew size will be increased in FY 2009 to meet this growing requirement as was originally foreseen.

QUESTION 171:

Are more European and Japanese experiments planned than U.S. experiments over the next several years?

ANSWER:

More than 30 U.S. research investigations were operated in increment 14, and again in increment 15. It is anticipated that European and Japanese research will eventually reach similar proportions as their laboratories are tested and their transfer vehicles, containing re-supplies, become available in the 2008-09 period. In order to keep pace with this international growth in research on board the ISS, it is essential that the U.S. Commercial Orbital Transportation Services (COTS) program also demonstrate capability at the earliest achievable time frame (currently projected to be 2010). If the U.S. domestic COTS capability is delayed, then the U.S. research program could also be delayed.

QUESTION 172:

Is your plan still to complete U.S. utilization of the space station in 2016? If so, what do you anticipate will have been the scientific payoff from the U.S. investment in this facility?

ANSWER:

While no decision on the end-date for the ISS operations has been made, NASA's current outyear budget plans do not include funding to operate the ISS beyond 2016, but the Agency is taking no action to preclude ISS operations beyond 2016. Future decisions on the end-date for ISS operations will be based on discussions with the ISS international partners, progress toward the President's Exploration goals, and the affordability of projected ISS operations costs.

In terms of the research itself, it is difficult to predict with certainty the schedule for completion of basic research because of the non-linear nature of scientific advance. Since biomedical research to extend crew health and performance in space is a top NASA priority for the ISS, the rate of progress is directly affected by the statistically significant number of crew available to serve as subjects. NASA has estimated that it may be possible to quantify the physiologic response of the human system and identify a suite of countermeasures against deleterious effects of prolonged space flight by 2016.

The Exploration Research Program utilizes the ISS as a test bed for developing, demonstrating, and solving problems in the areas of life support, with respect to technologies that are not particularly mature, that is, low Technology Readiness Level (TRL), such as, fire safety, power, propulsion, fluids and thermal management, materials technology, habitat design. The Non-Exploration Research Program utilizes the ISS to carry out fundamental experiments not directly related to supporting the human exploration program. By 2016, we will have completed all of the currently planned experiments in microgravity Combustion Science, Fluid Physics, and Materials Science. The currently planned ISS-based physical sciences flight experiments to be conducted from the present through 2015 number approximately 11 in Combustion Science, 14 in Fluid Physics and 7 in Materials Science. It is anticipated that much of this is low- TRL data will be then useful for the development of advanced systems to enable future exploration missions.

The scientific payoff of U.S. investment in this research will be a better understanding of how to keep humans healthy during exploration missions longer than those in our current experience base, as well as the development of new technologies for doing so. NASA's research results have in the past resulted in "spin-offs" that have benefited humans on Earth, and this will undoubtedly be the case with the current ISS research as well.

QUESTION 173:

Dr. Griffin, how confident are you that the costs and schedules for the Constellation program and the ability to deliver Constellation projects to initial operating capability are on track and on budget?

ANSWER:

Determining confidence levels regarding project cost and schedule success is a major function of a Program manager and a standard part of the program management process. Program managers constantly weigh schedules against available resources and recommend adjustments, as necessary, in order to achieve established program milestones. This past year, NASA performed a cost confidence level analysis and is now embarking on performing a schedule confidence analysis effort to better understand the Agency's success in meeting the defined schedule. The analysis will identify the probability of achieving the current schedule and identify the required contingency to account for any schedule uncertainty. The cost confidence analysis performed by the Constellation Program states that an Initial Operational Capability (IOC) or March 2015 can be achieved with 65 percent cost confidence.

Constellation is primarily a systems engineering and integration effort, based on the use of as many flight-proven concepts and hardware as possible, including the capsule design of Orion Crew Exploration Vehicle, the Shuttle RSRBs and External Tank, the Apollo-era J-2X upper stage engine, and the RS-68 core engine. NASA is capitalizing on the nation's prior investments in space technology wherever possible. Full funding of NASA's FY 2009 budget request for Constellation is needed so that NASA can continue successful transition between the Shuttle and the Orion and Ares I. The FY 2009 budget request maintains Orion IOC in March 2015 at a 65 percent cost confidence level and full operational capability (FOC) in FY 2016, though NASA is striving to bring this new vehicle online sooner.

QUESTION 174:

Generally speaking, do you believe NASA is pursuing the correct strategy in Constellation?

ANSWER:

At present NASA funding levels, the budget is sufficient to support a variety of excellent space programs, but it cannot support all of them. Balanced choices must be made. But they cannot be continually remade if there is to be progress. Alternatives were amply considered and thoroughly debated in the two years that elapsed between President Bush's announcement of the Vision for Space Exploration in January 2004, and the strongly bipartisan ratification of the goals of the Vision in the NASA Authorization Act of December, 2005. As goes without saying, NASA will execute the law of the land. Until and unless the Congress provides new and different authorization for NASA, the law of the land specifies that we will complete the International Space Station, retire the Shuttle, design and build a new spaceflight architecture, return to the Moon in a manner supporting a "sustained presence", and prepare the way for Mars.

We are doing those things as quickly and efficiently as our appropriated funding allows. System designs for the early elements have been completed, contracts have been let, and consistently solid progress is being made with a minimum of unexpected difficulty. Applying resources in the right direction, irrespective of pace, is always productive, and we are doing that. Ares and Orion as they are presently taking form are the building blocks for any human future beyond low Earth orbit (LEO).

As NASA Administrator Griffin outlined in a 2007 speech, NASA is moving forward with a new focus for its human space program -- to go out beyond LEO for purposes of human Exploration and scientific discovery. If humans are indeed going to travel to Mars, if we are going to go beyond, we have to learn how to live on other planetary surfaces, to use what we find there and bend it to our will. If we are to maintain our global leadership as a spacefaring Nation, we have to survive in other forbidding, faraway places across the vastness of space. The Moon is a crucially important stepping stone along that path; it is an alien world, yet one that is only a three-day journey from Earth.

The principal features of the Vision for Space Exploration, and the subsequent 2005 Authorization Act, are directly traceable to the recommendations of the Columbia Accident Investigation Board (CAIB). President Bush acted on those recommendations in his proposal to Congress. No such far-reaching proposal should be adopted without debate. That debate was had, in 2003, 2004, and 2005, and it was fulsome. From it came a unifying plan for civil space.

No plan can fully satisfy all the many constituencies we have within the "space community." But as the CAIB noted, it would be far worse to continue the prior multi-decade lack of any strategic plan, to continue dithering and debating and inevitably widening the gap between shuttle retirement and the availability of new systems. The 2005 Authorization Act codifies a great strategic plan for civil space exploration.

QUESTION 175:

What are the biggest technical challenges facing you today in meeting the Constellation program milestones?

ANSWER:

One of the top Constellation Program technical risks is the development of the Ares I upper stage engine, J-2X. Currently, the J-2X is one of the critical path items within the Program. In an effort to retire the development risk of the J-2X, the Program has decided to add resources to the development to make it more robust. This change incorporates additional testing hardware and tests to increase the confidence of success. This enhancement also includes early activation of the altitude test stand, additional tests, and additional engines for testing.

Another technical risk within the Constellation Program is the Ares Thrust Oscillation induced by the internal configuration of the reusable solid rocket motor. During design analysis, it was observed that here is a possibility that the thrust oscillation could cause unacceptable structural vibration. A "tiger team" was created to further study the potential issue and develop mitigation strategies. Mitigation options identified to date could include stiffness and dampening design changes to the Ares I first stage, Interstage, LOX and LH2 Tank Barrel and Instrument Unit structures.

QUESTION 176:

NASA's approach for Constellation activities relies on the accumulation of large rolling budget reserves. Is this still the case?

ANSWER:

This is no longer the case. Reserves through FY 2010 are at seven percent, and threats are being worked through a vigorous risk management process. Now that all major contracts are in place, NASA is projecting that at least 96 percent of Constellation's FY 2008 funds will be obligated by the end of FY 2008.

Orion and Ares

QUESTION 177:

Please provide the Committee with an update on the progress of both the Orion and Ares launch vehicle programs. In particular, where are they in regards to cost, schedule, weight and performance?

ANSWER:

NASA's Constellation program has moved beyond being just a mere concept on paper; we are making real progress. We have tested hardware; we have tested landing systems; and we have logged thousands of hours in wind tunnels. So far, NASA engineers have conducted more than 4,000 hours of wind tunnel testing on subscale models of the Ares I to simulate how the current vehicle design performs in flight. These wind tunnel tests, as well as NASA's first scheduled demonstration test flight for Ares I, known as Ares I-X, which is scheduled for spring 2009, and will lay the ground work for maturing the Ares I final design. In addition, all major elements of the Orion and Ares vehicles were placed under contract by December 2007.

NASA has a dedicated group of civil servants and contractors who work together to check and cross-check the multiple variables that go into designing and eventually operating these future Exploration vehicles. Constellation also has an integrated schedule and we are meeting our early milestones. In 2007, Constellation completed a "Season of System Review Requirements" for the program and its projects. Design reviews are essential to good engineering practice. The year culminated with an Orion Point of Departure (POD) design and a green light to move forward to the Preliminary Design Review (PDR). An Integrated Stack Technical Interchange Meeting also was a great success with all top issues being resolved. Thus, the Constellation program was able to strike a technical baseline from which integrated assessments can be formed. The program also closed the architecture for going back to the Moon and now has a clearer understanding of its growth path toward that goal. Constellation also has the green light to move forward in developing systems for a lunar capable vehicle that meets our budgets and schedule needs. Agency leadership has embraced the results of this season of reviews and has approved the Constellation program to precede with PDR for both Orion and Ares I this Fall.

During 2007, the Orion project tested numerous options for landing systems, including air bag systems of varying configurations, and the project began fabrication of a flight test article for Pad Abort Test-1. Both the Orion and Ares projects also conducted numerous recovery parachute drop tests in Yuma, Arizona to better understand the reefing performance of the pilot and main chutes. Last year also included a season of design reviews for the Orion project. After completing a System Definition Review (SDR) in August, the Orion team realized that the Orion configuration was too heavy, so NASA then began an effort to establish the POD configuration for the Orion spacecraft that would meet requirements for mass, power and cost. In November 2007, NASA senior leaders, including Administrator Griffin, approved the POD and approved Orion to move forward into the PDR design cycle, which is scheduled to conclude this fall.

Last year, the Ares project office conducted a season of SDRs for its major elements: First Stage, Upper State and Upper Stage engine. These activities concluded with the integrated Ares I SDR in October 2007. In support of Orion and Ares I SDRs, a series of integrated vehicle analyses were conducted to characterize performance of the Orion/Ares I stack.

In December 2008, NASA will complete the integrated stack sync point for Orion and Ares I, which is a key milestone in the development progress of these projects. The integrated stack sync point will demonstrate that Ares I and Orion preliminary designs, as well as the integrated stack analyses, have met all system requirements within acceptable risk and within the cost and schedule constraints. The sync point establishes the basis for proceeding to the Constellation Program-level PDR. The integrated sync point also will show that the correct design options have been selected; interfaces have been identified; and verification methods have been described. The Orion and Ares I project offices are currently finalizing data products required to meet their individual project level PDRs. Should key information not be available by December 2008, the program will evaluate delinquent data product status and provide a strategy to ensure products are available to support the program PDR. The program office would then apply appropriate resources to mitigate delinquent product risks.

QUESTION 178

Can you give us a snapshot of what we should expect to see in 2008 for Orion and Ares – what technical and programmatic milestones are planned in 2008?

ANSWER:

The Constellation Program System Definition Review (SDR) is scheduled to be held in summer 2008, which will verify that all flight projects are ready to proceed with preliminary design activities. The Orion and Ares I Projects are scheduled to complete their respective Preliminary Design Review (PDR) milestones by the fall of 2008; upon successful completion, these projects will transition from formulation to development.

A key indicator of progress in developing Orion and Ares I will be the completion of the "integrated stack sync point" scheduled for December 2008. The integrated stack sync point is the point in the design process which demonstrates Ares-1 and Orion preliminary designs, as well as the integrated stack analyses, meet all system requirements with acceptable risk and within the cost and schedule constraints. The sync point establishes the basis for proceeding to the Program level PDR. It will show that the correct design options have been selected, interfaces have been identified, and verification methods have been described.

2008 also proves to be an active year for hardware activities. In early to mid-2008, Ares I will begin fabrication of the 1st Stage Development Motors 1 and 2, complete construction of the upper stage Common Bulkhead Demonstration article and also deliver the first Ares I-X demonstration test flight hardware to KSC in October 2008. Orion culminates the year with a test of the launch abort system at the White Sands Missile Range in New Mexico.

QUESTION 179:

To date, are these activities on schedule?

ANSWER:

Yes -- all activities are on schedule. Orion and Ares-1 Project Offices are currently finalizing data products required to meet their individual Project level Preliminary Design Reviews (PDR). These reviews provide opportunities to confirm that the subject activities, products, and process control requirements have been adequately flowed to -- and implemented within -- the projects. The projects, along with the program, are tracking all products required for PDR to insure all data is available on time and at the appropriate maturity level. Additionally, the Program Office is conducting integrated stack analyses to support both PDRs. These activities lead to a higher confidence that products required to support the integrated stack sync point are in work and will be available for the sync point.

QUESTION 180:

Why has NASA not requested additional funding in FY 2009 to accelerate initial operating capability and to narrow the gap? Were they fiscal or programmatic considerations that drove your decision?

ANSWER:

NASA did have this discussion with the Administration as part of the normal course of content prioritization that takes place in all budget formulation activities. Given the need to balance a total NASA portfolio to meet the Agency's strategic goals, NASA believes this budget represents the best possible outcome given the nature of total funding constraints.

QUESTION 181:

If it were a fiscally-driven determination, what trade offs did NASA consider in whether to move initial operating capability forward or not?

ANSWER:

NASA did have this discussion with the Administration as part of the normal course of content prioritization that takes place in all budget formulation activities. Given the need to balance a total NASA portfolio to meet the Agency's strategic goals, NASA believes this budget represents the best possible outcome given the nature of total funding constraints.

QUESTION 182:

What would it cost to accelerate initial operating capability to 2014? How would it affect your "confidence level"?

ANSWER:

NASA's current estimate for Orion and Ares I Initial Operational Capability (IOC) is March 2015. Acceleration to FY 2014 at a 65 percent cost confidence level would require an additional $350M in FY 2009 and $400M in FY 2010. NASA would continue to plan to our aggressive internal schedules, but would have the reserves required to react to the unplanned (but expected) technical issues while minimizing overall schedule delays.

QUESTION 183:

When does NASA hit the point of no return in terms of crew exploration vehicle (CEV) acceleration from a funding standpoint – for example, NASA needs funding of what amount by what date or CEV cannot be accelerated?

ANSWER:

Acceleration is still a possibility if Constellation were to receive additional funding equal to the amounts previously stated. In order to accelerate the Ares I and Orion IOC, and provide for a 65 percent cost confidence level for a 2014 IOC instead of 2015, NASA would need an additional $350M in FY 2009 and an additional $400M in FY 2010. NASA would layer more reserves earlier to achieve a 65 percent cost confidence level in 2014. This would yield a higher spending curve than what goes with the 2015 IOC.

It takes up to six months for contract direction to be enacted, so the later additional funding arrives in FY 2009, the less likely NASA would be able to fully accelerate the IOC.

Ares Thrust Oscillation

QUESTION 184:

Can you describe the phenomenon and what its implications might be on the safety of the crew during launch?

ANSWER:

Thrust oscillation or resonant burning is a characteristic of all solid rocket motors, like the First Stage of the Ares I launch vehicle, and is caused by vortex shedding inside the solid rocket motor, similar to the wake that follows a fast moving boat.

When the vortex shedding coincides with the acoustic modes of the motor combustion chamber, pressure oscillations generate longitudinal forces that may impact the loads experienced by the Ares I during flight, and may exceed allowable loads on various portions of the vehicle and allowable forces on the astronaut crew. Initial analysis of the integrated launch vehicle stack shows that dynamic acceleration of about +/-5 G's, in addition to the static acceleration, may result from thrust oscillation late in First Stage flight. Excessive accelerations during launch can potentially impact crew performance during launch and longer-term crew health.

QUESTION 185:

Is the threat so serious that it threatens the system's design?

ANSWER:

No. The NASA chartered Thrust Oscillation Focus Team (TOFT), have conducted analysis that have already led to several mitigations, including the removal of a significant amount of conservatism from within existing models, correlating to significantly lower loads, by a factor of almost two. Additionally, the team was able to remove the first longitudinal mode as an issue – the remaining effects are now in a narrow, manageable region in the 12Hz frequency range. NASA will conduct additional analysis coupled with upcoming flight test on the Shuttle (STS 125, planned for August, 2008) and Ares I-X (planned for April, 2009) to better characterize this phenomenon, which may further reduce loads. In sum, NASA is confident in its ability to mitigate the risks associated with thrust oscillation, and NASA will keep Congress and this Subcommittee informed about our progress in doing so.

QUESTION 186:

Press reports indicate that senior managers were told of the findings last fall, but NASA would not talk about them publically until a Freedom of Information Act request was filed. Why has NASA avoided speaking about these problems – is it more serious than you are leading us to believe?

ANSWER:

During the Ares-I System Definition Review (SDR) in October 2007, thrust oscillation was identified as a potential impact to the integrated Ares/Orion stack. In November 2007, NASA chartered the Thrust Oscillation Focus Team (TOFT) to:

- Review the forcing functions, models and analysis results to verify the current predicted dynamic responses of the integrated stack
- Identify and assess options to reduce predicted responses
- Validate and quantify the risk to the Ares I vehicle, Orion spacecraft, crew, and other sensitive subsystems and components to the extent allowed by the Ares I/Orion design maturity
- Establish and prioritize mitigation strategies and establish mitigation plans consistent with the Constellation Program integrated schedule

The Thrust Oscillation Focus Team (TOFT) initially met in November 2007 and was required to submit findings to NASA management in March 2008. The TOFT worked with Sensitive but Unclassified (SBU) guidelines and company proprietary data during their assessment period, and all assessments were considered pre-decisional. Now that the TOFT study is concluding, results can be provided.

QUESTION 187:

What are the cost and schedule implications?

ANSWER:

Both Orion and Ares-I projects are continuing with Preliminary Design Reviews, scheduled for later in 2008. Overall costs and schedule impacts are not currently known, as impacts and mitigation strategies are currently being defined by the projects. Cost and schedule implications will be better understood as the projects mature their designs through the preliminary design process.

Shuttle/Constellation Workforce Transition

QUESTION 188:

What is NASA doing to ensure the Shuttle/Constellation transition is a smooth one unlike the earlier transition from Apollo to Shuttle?

ANSWER:

NASA seeks to make the transition from Shuttle to Constellation much smoother, more efficient, and less impactful than the abrupt program termination and six year period between the Apollo to Shuttle programs. In order to accomplish this, NASA conducted extensive benchmarking of other similar large program retirements, transformations, or transition both within government and in industry. Lessons learned databases and historical records have also provided a solid foundation for detailed planning and coordination efforts that are captured in several over-arching management documents including the current Human Spaceflight Transition Plan

(2006), the Multi-Program Integrated Milestones Chart (www.nasa.gov/transition), and the pending updated release of the NASA Transition Plan this summer 2008. NASA's efforts focus on three primary areas-- Workforce, Property/Infrastructure, and Budget/Schedule--in order to proactively ensure as smooth of a transition as is possible. As further validation of our effective processes, extensive internal and external reviews and inclusive planning and execution activities ensure stakeholder engagement, stability, long-term strategic leadership, and effective risk control – all of which are the hallmarks of a successful transition.

QUESTION 189:

What details can you give on the transition plan; what has been accomplished and what near-term actions have been implemented and what actions are planned?

ANSWER:

The current Human Spaceflight Transition Plan (2006), the Multi-Program Integrated Milestones Chart (MPIM) (www.nasa.gov/transition), and the pending updated release of the NASA Transition Plan this summer contain the detailed NASA management plan for transition. The MPIM captures and graphically correlates all of the current and projected Shuttle, Constellation, ISS, and COTS milestones from the present through 2020 with Facilities and Infrastructure milestones also included in order to facilitate comprehensive and integrated systems planning. Additionally, the NASA Workforce Transition Initial Report submitted to Congress also outlined the Agency strategies and mitigation plans for our vital workforce. Property transfers to the Constellation Program, disposition of excess Shuttle assets, prudent workforce and skill mix assessments, construction of facilities, Constellation requirements definition and sub-system testing in addition to budget and resource planning highlight the near term actions and accomplishments. Planned actions include refinement of the workforce and skills mapping activities, forward progress toward Constellation Preliminary Design Reviews, continued facilities planning and assessment, further property assessment and disposition activities, and maturation of transition risk management approaches.

QUESTION 190:

Which future programs in Constellation will have the most positive impact on workforce transition and skills retention? ESMD Which will have the least?

ANSWER:

The key to a smooth and effective transition is careful planning, efficient execution, and diligent design, development, test, and evaluation in the Constellation program in order to create the exciting current and future demand for our skilled workers, particularly in the lunar work ahead. Efficient programmatic execution is vital to workforce transition and skills retention. From our Shuttle workforce surveys, the single most compelling motivator for retention is exciting and meaningful work towards an important and challenging mission. The current Ares, Orion, and preliminary lunar work are all key to long term workforce transition and skills retention as we capture best practices, operational experience, and corporate know-how to maximize the safety and mission success of our Constellation systems portfolio. Likewise, the important research in the Exploration Technology Development, Human Research, and Lunar Precursor Robotic Programs are the key to creating the tools, capabilities, and mitigations to explore further. Synergy between all these elements positively engages our workforce while helping ensure sustainment of a workforce to conduct a safe and successful Shuttle manifest and ISS assembly and scientific investigation period. Every job in this transition is a positive forward element of engagement and employment – there is no least impactful area. All of the programs exist to collectively enable the broader NASA objectives outlined in the U.S. Space Exploration policy and law as defined by the NASA Authorization Act of 2005.

QUESTION 191:

Given the delays experienced to date in this program, when is the most credible date that commercial crew transfer service might be available?

ANSWER:

As part of COTS, NASA intentionally limited its investment in privately developed spacecraft by first requiring the successful demonstration of an orbital cargo mission before considering additional investment in the more difficult crew transportation capability. Some of the top risks associated with approaching and berthing with the ISS are common to both cargo and crew missions, and waiting for successful cargo mission demonstrations will close these risks before placing additional crew in the mix. In essence, NASA believes it is important to first demonstrate cargo services before even considering a demonstration of the transportation of our most valuable commodity – American astronauts.

In 2006, NASA pre-negotiated a Capability D option with SpaceX for $308M. NASA does not plan to exercise this option, nor is NASA required to exercise this option. NASA must take into account that the pre-negotiated Capability D agreement with SpaceX will be four years old in 2010, the year when SpaceX's cargo demonstrations are scheduled to conclude. Given that technological advancements in the commercial space sector will likely occur between now and 2010, if sufficient funding were available for a Capability D demonstration, NASA would hold a full and open competition to find the best partner to demonstrate crew transportation services. Doing so would ensure that NASA has the best proposals to choose from at the best value for the American taxpayers. SpaceX would be able to compete in this competition.

With the recent change in the SpaceX milestones for their cargo demonstrations, we estimate the earliest possible date for a SpaceX Capability D would be mid to late FY 2012; however, Capability D is currently unfunded.

NASA has committed its budget for the Constellation Program to developing the next generation human spaceflight vehicles. Any shift in this funding would further delay the planned March 2015 operational readiness of the Orion and Ares vehicles.

Similarly, NASA's crew/cargo budget line for the ISS is allocated to deliver essential resupply cargo to the ISS.

QUESTION 192:

NASA chose to restore the reductions taken by Congress in the FYs 2009 and 2010 budgets. Why?

ANSWER:

In FY 2009, NASA is requesting $173M for the Commercial Crew and Cargo Program and its associated Commercial Orbital Transportation Services (COTS) projects. Full funding is essential to maintaining NASA's promised $500M investment in this program to spur the development of U.S. commercial space transportation services to and from LEO while also providing substantial savings to the taxpayer compared to NASA Government-owned and operated capabilities.

By investing in U.S. private industry through COTS, NASA is facilitating development of reliable, cost-effective access to low Earth orbit (LEO). The intent is to create a market environment in which commercial space transportation services are available to Government and private sector customers. The availability of safe, reliable and economical service to LEO will help NASA achieve the Nation's goals of retiring the Space Shuttle and building a new space transportation system that can return humans to the moon and start them off on a voyage to Mars.

QUESTION 193:

To what extent has the delay in awarding a new second funded partner in the COTS program impacted both the overall program schedule and the likelihood that COTS providers will be able to deliver cargo and crew?

ANSWER:

Under a Space Act agreement with NASA, Rocketplane Kistler (RpK) had been receiving seed money to develop and demonstrate commercial orbital transportation services that could open new markets and pave the way for private companies to launch and deliver cargo to the International Space Station. In September 2007, NASA determined that RpK had failed to perform according to its agreement. After lengthy discussions with the company, on October 18, 2007, NASA notified RpK in writing that it was terminating the company's SAA for failure to perform.

On February 19, 2008, NASA announced the selection of Orbital Sciences Corporation of Dulles, Virginia, for a second funded SAA. If Orbital successfully meets the milestones in the SAA, Orbital will receive approximately $170M to supplement its privately funded efforts and is planning to conduct a demonstration flight to ISS in December 2010.

Terminating the RpK SAA and awarding the Orbital SAA has had no negative impact on the overall COTS project. With two funded SAAs, NASA hopes to increase the likelihood that commercial providers will be able to demonstrate cargo delivery to the ISS by 2010.

QUESTION 194:

I understand that SpaceX has informed NASA that the company is projecting a six to nine month slip of their launch demonstration and it is now planned for March 2010. What is the specific cause of the delay?

ANSWER:

In early February 2008, SpaceX formally notified NASA they are projecting a six to nine month delay in the launch of their Falcon 9 launch vehicle and Dragon spacecraft demonstration missions. The first orbital demonstration milestone, originally scheduled for September 2008, is projected to launch in June 2009. The third and final demonstration milestone, a mission to the ISS is now planned for March 2010, delayed from September 2009. The delay is primarily due to technical issues recently resolved with the new Merlin 1C engine and launch site preparations at Cape Canaveral. The demonstration launches were previously planned to be conducted from Kwajalein in the Marshall Islands.

On February 28, NASA executed an amendment to its SAA with SpaceX, renegotiating the milestones to align the current development and demonstration schedule with ISS integration activities. In addition, several new milestones were added and others modified to allow additional insight and clarification to objective measures of progress for the demonstration program SpaceX has met all milestones to date and continues to make excellent progress in the development of its launch vehicle and cargo capsule. The total NASA investment in this agreement of up to $278M remains the same. Individual performance payments for some milestones have been adjusted. SpaceX has received a total of $139M for successfully completing the first eight milestones.

QUESTION 195:

How do the delays experienced by SpaceX compare to the failure of the first Space Act agreement (with Rocketplane Kipler) to meet milestones? Are they similar setbacks?

ANSWER:

The SpaceX and RpK situations should not be compared, nor are their individual SAAs comparable. Each individual SAA has individual milestones and payment schedules based on their individual business plans.

Under a Space Act agreement with NASA, RpK had been receiving seed money to develop and demonstrate commercial orbital transportation services that could open new markets and pave the way for private companies to launch and deliver cargo to the International Space Station. During the course of its SAA, the company failed to meet a key financing milestone in its agreement. Funding challenges also caused

RpK to miss a technical milestone, a critical design review of its pressurized cargo module. NASA worked with the company for several months to allow them to meet the milestones, but in the end, NASA decided it was in the best interests of the Agency to terminate RpK's SAA. In September 2007, NASA determined that RpK had failed to perform according to its agreement. After lengthy discussions with the company, on October 18, 2007, NASA notified RpK in writing that it was terminating the company's SAA for failure to perform.

In terminating RpK's funded agreement, NASA did not preclude the company from continuing to participate in the COTS project through an unfunded agreement consistent with those in place with five other COTS participants, nor did NASA preclude RpK from submitting a proposal for consideration in the re-competition. RpK filed a protest with the Government Accountability Office (GAO) with regard to NASA's use of its "other transaction" authority to award a funded Space Act agreement in the re-competition, but the GAO denied RpK's protest.

SpaceX has had some technical issues, but not unexpected issues, given the development of a new launch vehicle and engine. SpaceX's recently-announced slip is due to the fact that SpaceX is trying to find a way to lengthen the life of its engine so that it is reusable more times. SpaceX also ran into some conversion problems with the pad at Cape Canaveral Air Force Station, Florida.

QUESTION 196:

Do these delays suggest serious underlying problems with the ability of U.S. industry to provide cargo and crew transportation services?

ANSWER:

From the beginning, NASA has considered the COTS project to be an investment in space commercialization. As such, this investment is not without risk, due to the nature of stimulating a market capability that is in its infancy. However, these delays do not suggest serious underlying problems in the U.S. commercial space transportation industry.

As described in the answer to Question 194, NASA believes that SpaceX is making excellent progress and that the delay, which resulted primarily from a technical issue, should not have a negative impact on the COTS project. In addition, NASA has added several new milestones and modified as part of the recent SAA amendment to align the current development and demonstration schedule with ISS integration activities and to allow additional insight and clarification of objective measures of progress of the demonstration program.

QUESTION 197:

How does rebalancing of the budget request for COTS in FY 2009 maintain the overall program schedule? In other words, how does the restoration of these reductions fill the hole in the schedule?

ANSWER:

In FY 2009, NASA is requesting $173M for the Commercial Crew and Cargo Program and its associated COTS projects in order to restore a funding cut that was made in the FY 2008 Consolidated Appropriations Act. Full funding is essential to maintaining NASA's promised $500M investment in this program to spur the development of U.S. commercial space transportation services to and from LEO while also providing substantial savings to the taxpayer compared to NASA Government-owned and operated capabilities.

QUESTION 198:

If payments are made to entities like Orbital and SpaceX only when certain milestones are met and given the continuing delays in progress, isn't it likely that funds allocated in FYs 2008 and 2009 are in excess of actual requirements?

ANSWER:

Individual milestones and their associated payments are itemized in each SAA, and NASA has a legal obligation to pay those milestones when they are met. As with any technical development program, there is a potential that a milestone may slip into a future fiscal year. However, NASA does not anticipate multiple milestones moving into subsequent years, and if that happened, NASA would first evaluate if such SAA is still in the Agency's best interests. If that answer is affirmative, then NASA could negotiate an amendment to the current SAA, as was the case with SpaceX.

In addition, NASA pledges to keep Congress informed should such a situation occur in the future.

QUESTION 199:

When does NASA expect to activate Space Act agreements for Phase D (crew return services)?

ANSWER:

Capability D is not funded as part of NASA's current budget.

NASA has committed its budget for the Constellation Program to developing the next generation human spaceflight vehicles. Any shift in this funding would further delay the planned March 2015 operational readiness of the Orion and Ares vehicles. Similarly, NASA's crew/cargo budget line for the ISS is allocated to deliver essential resupply cargo to the ISS.

As part of COTS, NASA intentionally limited its investment in privately developed spacecraft by first requiring the successful demonstration of an orbital cargo mission before considering additional investment in the more difficult crew transportation capability, known as Capability D. Some of the top risks associated with approaching and berthing with the ISS are common to both cargo and crew missions and waiting for a successful cargo mission flight will close these risks before placing additional crew in the mix. In essence, NASA believes it is important to first demonstrate cargo services before even considering a demonstration of the transportation of our most valuable commodity – American astronauts.

It is also important to understand that NASA will still need to purchase Russian Soyuz crew transportation and crew rescue services to fill any gap between Shuttle retirement and the projected Capability D operationally available date., Soyuz support will also be necessary as insurance in the event that Capability D is not operational when projected.

In 2006, NASA pre-negotiated a Capability D option with SpaceX for $308M. NASA does not plan to exercise this option, nor is NASA required to exercise this option. NASA must take into account that the pre-negotiated Capability D agreement with SpaceX will be four years old in 2010, the year when SpaceX's cargo demonstrations are scheduled to conclude. Given that technological advancements in the commercial space sector will likely occur between now and 2010, if sufficient funding were available for a Capability D demonstration, NASA would hold a full and open competition to find the best partner to demonstrate crew transportation services. Doing so would ensure that NASA has the best proposals to choose from at the best value for the American taxpayers. SpaceX would be able to compete in this competition.

QUESTION 200:

The budget does not contain funding needed to activate Phase D agreements. What are the anticipated total costs for Phase D agreements as well as allocated in each fiscal year?

ANSWER:

Capability D is not funded as part of NASA's current budget.

NASA has committed its budget for the Constellation Program to developing the next generation human spaceflight vehicles. Any shift in this funding would further delay the planned March 2015 operational readiness of the Orion and Ares vehicles. Similarly, NASA's crew/cargo budget line for the ISS is allocated to deliver essential resupply cargo to the ISS.

In 2006, NASA pre-negotiated a Capability D option with SpaceX for $308M. NASA does not plan to exercise this option, nor is NASA required to exercise this option. NASA must take into account that the pre-negotiated Capability D agreement with SpaceX will be four years old in 2010, the year when SpaceX's cargo demonstrations are scheduled to conclude. Given that technological advancements in the commercial space sector will likely occur between now and 2010, if sufficient funding were available for a Capability D demonstration, NASA would hold a full and open competition to find the best partner to demonstrate crew transportation services. Doing so would ensure that NASA has the best proposals to choose from at the best value for the American taxpayers. SpaceX would be able to compete in this competition.

NASA is currently evaluating the schedule, mechanisms and funding that would be required to proceed with Capability D development. Once that analysis is completed, NASA would be happy to share it with Rep. Mollohan.

QUESTION 201:

Notwithstanding these challenges, in your opinion, should the U.S. invest more in these industry partners, recognizing that the U.S. is shipping in excess of $1 billion overseas? Should that be our paramount consideration – or is COTS just another form of corporate subsidy?

ANSWER:

From the beginning, NASA has considered the COTS project to be an investment in space commercialization, and with that investment, there were inherent risks associated with stimulating a market capability that is in its infancy. Therefore, NASA believes its $500M investment is sufficient "seed money" to spur the commercial space industry to develop and demonstrate commercial orbital transportation services. It is also important to understand that NASA is only one investor in the overall demonstration of commercial cargo services. The commercial space companies (and their other private investors) are the largest investors because they stand to reap the financial benefits of developing a proven commercial space transportation capability that they can sell to other non-NASA customers.

QUESTION 202:

The budget and its five-year rollout shows a decrease for FYs 2009 through 2012. Why has NASA de-emphasized its education program?

ANSWER:

NASA has not de-emphasized its education program. Though the 2009 request for NASA education is a reduction of $31.2 million from the 2008 enacted budget, it reflects the reality of addressing increasing mission operational requirements within limited funding.

Each program area in the Agency was impacted by the need to redirect funding. The Office of Education's budget reduction was further influenced by "Results Not Demonstrated" rating in last year's OMB Performance Assessment Rating Tool (PART) analysis due to the agency not providing sufficient data indicating the program's effectiveness. Some baseline data and results have now been submitted to OMB for review. Education is and will continue to be a fundamental element of NASA's activities reflecting a diverse portfolio of Higher Education, Minority University Research and Education, Elementary & Secondary/Education, and Informal Education Programs.

Background:

- The FY 2009 President's Budget Request for Education is $115.6M, which includes:
    - $46.5M for the Higher Education program to attract and prepare students for NASA-related careers, and enhance the research competitiveness of the Nation's colleges and universities by providing opportunities for faculty and university-based research.
    - $28.2M for the Minority University Research and Education program to attract and prepare underrepresented and underserved students for NASA-related careers and enhance competitiveness of minority-serving institutions by providing opportunities for faculty and university- and college-based research.
    - $32.1M for the Elementary & Secondary Education program to make available NASA-unique strategies, tools content, and resources supporting the K-12 education community's effort to increase student interest and academic achievement in STEM disciplines.
    - $6.8M for the e-Education program to develop and deploy technology applications, products, services and infrastructure to enhance the educational process for formal and informal education.
    - $2.0M for the Informal Education program to establish the forum for informal education community efforts to inspire the next generation of explorers and innovators and make available NASA-unique strategies, tools, content, and resources to enhance their capacity to engage in STEM education.

QUESTION 203:

How do these funding recommendations not undermine the findings of the National Academies report "Rising Above the Gathering Storm", which proposed broad recommendations to enhance science and technology enterprise, including vastly improving K-12 science and mathematics education?

ANSWER:

- The findings of the National Academies report "Rising Above the Gathering Storm" challenged NASA to continually evaluate its education priorities and options.
- Rather than undermine NASA's efforts to address the recommendations of the National Academies, the funding recommendations will result in the Agency's increased diligence in streamlining and maximizing its portfolio in support of its goals.

Background:

- NASA is working with the National Research Council to improve the effectiveness of its education programs. The National Research Council recently released the report *NASA's Elementary and Secondary Education Program:*

Review and Critique. The recommendations are being reviewed and incorporated by NASA into its programs and activities.

- In FY 2008 Congress redirected funding for four new projects, the Competitive Educational Grant Program; Global Climate Change Education, Science Center, Museum, Planetarium Grants; and NASA Visitor Centers.
- NASA is designing these new projects taking into consideration the recommendations put forth by "Rising Above the Gathering Storm." For example, the Global Climate Change Education program will address innovative opportunities for educating students on global climate change with a special component focusing on teacher education preparation (pre-service). The program will work to strengthen the skills of teachers as well as provide innovative STEM research and learning opportunities for students, which are two actions recommended in "Rising Above the Gathering Storm" to vastly improve K-12 science and mathematics education. Also, through existing projects that provide undergraduate scholarships such as Motivating Undergraduates in Science and Technology (MUST) and Undergraduate Student Research Project (USRP) NASA is supporting increases in the number and proportion of U.S. citizens who earn STEM bachelor's degrees.

QUESTION 204:

Specifically, what NASA education programs will face cancellation, reduction or deferment?

ANSWER:

- In order to maintain an ideal portfolio identified by the Education Coordinating Committee (ECC), the Office of Education balanced the Agency's three education outcomes with NRC recommendations and Congressional priorities which added requirements without commensurate funding. The need to minimize impact to individual programs resulted in the following reductions and consolidations:

- Elementary & Secondary Education
    - Education Flight Projects: from $4.97M to $4.14M (reduction of $0.83M);
    - NASA Explorer Schools (NES): from $10.77M to $6.62M (reduction of $4.15M);
    - Science Engineering Mathematics and Aerospace Academy (SEMAA): from $3.32M to $2.43M (reduction of $0.89M).
    - Educator Astronaut Project and Education Flight Projects (consolidated FY 2009)
- Minority University Research Education Program (MUREP)
    - NASA Administrators Fellowship Project (NAFP): from $3M to $0.6M (reduction of $2.4M).
    - The following were consolidated into "Research Clusters" FY 2009
        - Curriculum Improvement Partnership Award for the Integration of Research (CIPAIR)

        - NASA Science and Technology Institute for Minority Institutions (NSTI-MI)
        - Motivating Undergraduates in Science and Technology (MUST)
        - Harriett G. Jenkins Predoctoral Fellowship Project (JPFP)
        - NASA Administrator's Fellowship Project (NAFP)
- Higher Education
    - Experimental Program to Stimulate Competitive Research (EPSCoR): from $9.98M to $8.28M--(reduction of $1.7M)

QUESTION 205:

To what extent were funding decisions considered in the context of the Academic Competitive Council? Please be specific.

ANSWER:

- Funding decisions were made based on several factors including:
    - Independent, objective, evidence-based evaluations completed on projects as recommended by the Federal Academic Competitiveness Council Report;
    - Draft recommendations provided by the National Research Council (NRC) study, "NASA's Elementary and Secondary Education Program: Review and Critique;"
    - Program performance as rated by the 2007 OMB PART analysis;
    - Agency workforce priorities; and,
    - Education priorities (based on our outcomes).

Background:

- The budget request for the NASA Education Program is consistent with the NASA Education Strategic Framework and the national goals established by the ACC.
- NASA requires an independent, objective, and evidence-based evaluation that employs the most rigorous methodologies appropriate to the evaluation. If deemed appropriate and recommended by the third party, the evaluation should employ or include a Randomized Control Trial design with treatment and control group comparison, as recommended by the Federal Academic Competitiveness Council Report. All Office of Education projects will be evaluated over a five-year period by an independent evaluator.
- The NRC identified seven different projects under the Elementary and Secondary Education Program for close examination. Projects include: Aerospace Education Services Project (AESP); Digital Learning Network (DLN); Educator Astronaut (EA); Education Flight Projects (EFP); Interdisciplinary National Science Program Incorporating Research and Education (INSPIRE); NASA Explorer Schools (NES); and, Science, Engineering, Mathematics and Aerospace Academy (SEMAA).
- The 22 recommendations from the NRC for the NASA Office of Education is inclusive of evaluation, designing new models for several elementary and secondary projects, increased partnering with external education experts and non-

profit organizations, increased opportunities for professional development of teachers and updating technology. The three projects identified with reductions in FY 2009 -- Flight Projects, NES, and SEMAA – are taking steps in FY 2008 to address recommendations and begin necessary alterations that include consolidation and efficiencies that minimize impact to each project with budget reductions in FY 2009.

- The NES underwent an independent evaluation in FY 2007, SEMAA project will undergo a third-party evaluation in FY 2008 and Flight Projects will be evaluated in FY 2009.
- Three major projects within the Higher Education and Minority University Research and Education programs were restructured in FY 2008 to refocus project activities to address an increasingly diverse student population in a manner that is focused and aligned with Agency workforce needs.
- NASA has been actively engaged with the ACC and its three working groups, assigning at least one staff member to each group – Higher, Elementary & Secondary, and Informal Education – who have attended each working group meeting.The Office of Education budget was influenced by "Results Not Demonstrated" rating in last year's OMB Performance Assessment Rating Tool (PART) analysis due to the agency not providing sufficient data indicating the program's effectiveness. Some baseline data and results have now been submitted to OMB for review.

QUESTION 206:

Does NASA track the number of student participants in its STEM programs, and if so, how many (numbers and percent) actually remain in the STEM pipeline?

ANSWER:

- NASA does collect information about the number of students involved in its STEM programs. Baseline data for one year, reported in December 2007, show 45 percent of students who receive support from certain NASA higher education programs and are eligible for employment are working for NASA or aerospace contractors, or at universities and other educational institutions in occupations relevant to the NASA mission. These students received scholarships, fellowships, or stipends totaling greater than $5K or participated in internships of at least 160 hours; this includes national higher education and MUREP projects within the Office of Education Portfolio. Responses, which are self-reported, come only from students who have completed terminal degrees.
    - 619 students in the NASA workforce pipeline met these criteria from Space Grant consortia, GSRP, Jenkins, and the Pre-Service Teacher Institutes.
    - Of the 407 students reporting, 182 (45 percent) were employed in the following categories: 24 by NASA, 17 by aerospace contractors, 141 by universities/education institutions.
    - Additionally, 177 students (43 percent) went into STEM-related careers, and 48 students (12 percent) went into non-STEM careers.

  - The remaining 212 students did not report career progress post-NASA participation.

- Baseline data also indicates that of 2,474 Space Grant students who received $5K support or 160 hours of internship in 2006, 1,955 of them are still enrolled in their current degree programs. Of the remaining 519 students, 155 (30 percent) are seeking advanced degrees. MUST students will be included in these data by FY 2009.

- SEMAA surveyed 11,547 4-12 grade students, and 4,386 (50 percent) of the 8,740 respondents indicated plans to work in a STEM career (e.g., astronaut, engineer, scientist, doctor) after completing their studies.

Background:

- The NASA Office of Education recently established baseline performance data for all PART measures, and since then it has moved ambitiously to collect data, set targets, and benchmark NASA education programs against other Federal education programs.

- Future enhancements to our data collection will include standardizing survey questions to align more directly to PART measures, developing tools to more effectively aggregate collected data, and capturing data from student application materials.

Issues:

- To reliably determine the number of students that remain in the STEM pipeline from education through employment, it is necessary to track these students over time. Longitudinal data collection is challenging for several reasons including:
  1) privacy issues for minors preclude collecting data from Elementary & Secondary students, so students can not really be identified and tracked prior to starting undergraduate programs;
  2) longitudinal data collection is time consuming and expensive, thus NASA must balance the cost effectiveness of collecting data for students; and,
  3) after college graduation, students must be self-motivated to provide updated contact information and respond to surveys and other data collection activities.

- Under the auspices of the National Science and Technology Council Education Subcommittee, NASA is working with other agencies to develop a mechanism that will enable an accurate accounting of student graduation and employment in STEM careers, while not placing unreasonable financial or logistical burden on students, universities, or federal agencies.

QUESTION 207:

How does NASA track this information?

ANSWER:

- NASA presently relies on the grantees to track eligible student participants in its STEM programs and report the aggregate data to the Office of Education.
- In the future, the Office of Education will have a new database to enable grantees to uniformly feed consistent data to track and aggregate students across projects.
- The new database's primary function will be to allow the NASA Education Program to collect timely and credible performance information on all NASA Education projects, including information from program partners.

Background:

- In addition to tracking eligible student participants in its STEM programs, the new system, now under development, is being designed to consolidate the three different NASA Education evaluation databases currently in use: the NASA Education, Evaluation, and Information System (NEEIS), the Consortium Management Information System (CMIS), and the Performance Outcome and Student Tracking System (POSTrack). The database is on track for implementation at the beginning of FY 2009.

QUESTION 208:

The budget justifications indicate that in FY 2008, the education "program will continue to refine its measures and evaluation processes to aid decisions on investments, which will ensure the alignment and contribution to Education's goals." If your internal review process is still under development to determine the education portfolio's effectiveness to attract students to science and math as you state, how are such cuts proposed in this budget not premature?

ANSWER:

- The refinement of the NASA Education Program's measures and evaluation activities is an ongoing improvement process that was revitalized with the adoption of the strategic framework, the creation of the education coordinating committee, and adoption of the portfolio approach to managing NASA education investments.
- The Office of Education used the results of the annual portfolio alignment process, the baseline PART data, and the NRC study recommendations to determine where the budget reductions would be applied. It is a challenge to do project planning and apply evaluation metrics when there are major fluctuations in the budget year over year.
- The first Agency-wide annual education portfolio alignment activity in 2007 uncovered numerous opportunities to leverage projects, uncovered potentially duplicative efforts, and helped identify older "legacy" type projects that no longer served the outcomes and objectives of the Office of Education. Projects were identified for "sunsetting" and close out, or when appropriate, redesign and refocusing. The alignment, in concert with previous PART results and recommendations received by the NRC review panel, help identify where budget spending was inconsistent with adopted education priorities, informed new

project development, and determined how budget cuts might be appropriately applied

Background:

- NASA has developed and submitted to OMB a planning schedule to accomplish evaluations of all investments in the Office of Education budget. Each investment will be evaluated at least once during a five-year period using the most independent, rigorous, and reliable methods possible.
- The balance of the NASA Education portfolio across the Agency is addressed by the Education Coordinating Committee and thus discusses how to maintain results with changes in appropriations and funding.

QUESTION 209:

How does each of the mission directorates contribute to overall education programs?

ANSWER:

- The four NASA Mission Directorates, Aeronautics Research (ARMD), Exploration Systems (ESMD), Science (SMD), and Space Operations (SOMD), are contributing a total of $32M to in support of education in FY 2008.
- The Mission Directorate education projects are managed by the Mission Directorate itself, typically in concert with the Office of Education and Center education offices. These project budgets are tracked by the Mission Directorates separately from the OED budget, and efforts are underway to continue integrating performance outputs and outcomes into the OED PART activity. Mission Directorate activities managed at NASA Center education offices are reflected in PART measures.
- Mission Directorate-initiated projects focus on the individual strengths and interests of the Missions, and are aligned with the official NASA Education outcomes and objectives. By conducting education projects that address the full range of NASA's education outcomes and objectives, and by contributing unique technical content and expertise, the Mission Directorates are an integral and irreplaceable part of the NASA Education program.

Background:

- Representatives of each of the Mission Directorates are members of the NASA Education Coordinating Committee and participate in providing policy recommendations to the Assistant Administrator for Education.
- The ECC is a collaborative structure that maximizes NASA's ability to maintain an integrated education portfolio and strategically manage the implementation of numerous programs, projects, and activities in a distributed system. To achieve the education outcomes, the ECC plans and develops strategy collaboratively, allowing the Assistant Administrator of Education to assess and evaluate the health of the entire Agency education portfolio. The ECC provides an overarching Agency structure where issues are fully discussed to guide the AA for Education in making decisions. The ECC also provides checks and balances

for effective internal control and ensures the successful achievement of education goals and portfolio effectiveness.
- The Mission Directorates are responsible for embedding education components into their research and development programs and flight missions, for administering the discipline/content-specific activities for which they provide funding, and for ensuring meaningful collaboration between the NASA science/engineering community and the education community.
- Each Mission Directorate supports the NASA education portfolio by providing discipline-specific content, funding, and human resources to plan and implement educational programs, projects, products, and services. Additionally, Mission Directorates develop partnerships specific to their disciplines and needs, including discipline-specific interactions with other Federal agencies. Each Mission Directorate identifies an Education Lead, who represents their Associate Administrator to the Office of Education and to the Education Coordinating Committee with the authority to commit resources.

- For FY 2008 Science Mission Directorate's Education Budget is $21.9M.
- For FY 2008 Space Operations Mission Directorate's Education Budget is $2.5M.
- For FY 2008 Exploration Systems Mission Directorate's Education Budget is : $4.0M.
- For FY 2008 Aeronautics Research Mission Directorate's Education Budget is $4.1M
- The Mission Directorates are responsible for embedding education components into their research and development programs and flight missions, for administering the discipline/content-specific activities for which they provide funding, and for ensuring meaningful collaboration between the NASA science/engineering community and the education community.
- In accordance with the Balance of Power described in the Strategic Management and Governance Handbook (NPD 1000.0), the Office of Education Assistant Administrator, with input from the ECC, maintains control of strategy and top-level requirements, while Mission Directorates and the Office of Education maintain control of schedules and budgets for their own programs. Centers execute programs and projects and have a voice on the ECC to ensure coordination, integration, and teamwork. The ECC meets monthly and as requested by the Chair.
- The Mission Directorate budgets are approximate dollars for FY 2008 but actual budgets can vary due to dynamic circumstances.

New Education Programs Contained in FY 2008 Conference Agreement

QUESTION 210:

How does NASA intend to administer the cooperative grants programs for science museums and planetariums, and, in particular, the $8.5 million provided for grants to educate students in global climate change?

ANSWER:

- In FY 2008, Congress appropriated FY 2008 funds for the development of four new programs, two of which are discussed in this response. The first is a competitive program that funds grants, including cooperative agreements, to museums, science centers and planetariums. JPL will manage the solicitation and peer review process, and forward a summary of findings to NASA's Office of Education for award selection purposes. Award sizes are anticipated to range between $250,000 and $2,000,000. Awards will be assigned to a technical officer at a NASA Center. The second is a competitive grant program or improving the quality of global climate change education at the elementary, secondary, and university levels as recommended in the National Academies' Earth Science Decadal Survey. NASA Headquarters will manage the solicitation, peer review and selection processes. Award sizes are anticipated to range between $150,000 and $600,000. Awards will be assigned to a technical officer at a NASA Center.

- The NASA standard proposal and award process outlined in the research grant handbook will be used to administer both programs. Applicants to both programs will submit proposals in accordance with the grants.gov e-government guidelines.

QUESTION 211:

When will these new grant solicitations begin and when will the awards be made?

ANSWER:

- A Request for Proposal (RFP) - Related Resources for Museums and Planetariums page has been added to the NASA website advising prospective applicants of preparatory steps to take in anticipation of the science museum and planetarium RFP. Full details are at: http://www.nasa.gov/audience/foreducators/informal/mus-planetariums-index.html

- The museums, science centers and planetariums RFP will published through NSPIRES in late spring or early summer with proposals due 90 days later. Awards are scheduled by the NSSC to be made at the earliest in late FY 2008 or in early FY 2009.

- The global climate change education solicitation will also be published through NSPIRES and is scheduled for release in early summer. Proposals will be due 90 days later. Awards are scheduled for early FY 2009.

NASA Explorer Schools

QUESTION 212:

Please describe how NASA Explorer schools will maintain the level of rigor, community support and technical capabilities with the 50 percent funding reduction proposed for FY 2009?

ANSWER:

- The Office of Education plans to develop an alternative strategy for NASA Explorer Schools (NES) by partnering with existing education organizations that are providing exemplary STEM education projects within schools, districts and states. The FY 2008 Competitive Education Grant Program will be designed to support and foster creative approaches to improving STEM education, and the products, services, and process improvements derived from the solicitation will be applied to NES. This strategy will result in increased rigor, community support, and technical capabilities not only for NES schools, but also for a much broader reach in elementary and secondary education.

- The NES Project has identified the following objectives during FY 2008:
  - Re-scope project to align with NRC recommendations, analysis of baseline data gathered through continuous project evaluation, and adjusting activities and operations to reflect new budget conditions;
  - Maintain current commitments to NES under existing model in FY 2008; and,
  - Transition to work on new NES model.

- The 50 percent decrease in the NES budget will most likely decrease the investment per school, require a modification of the solicitation and selection process, and more sharply focus restructuring efforts to improve short and long-term results.

QUESTION 213:

Please describe for the Committee how Minority University Research and Education Project (MUREP) is to be restructured in FY 2009.

ANSWER:

- In FY 2009, the MUREP projects will be clustered into three main types of activities to gain efficiencies in management and oversight.

- Research Clusters, which includes:
  - Curriculum Improvement Partnership Award for the Integration of Research (CIPAIR);
  - NASA Science and Technology Institute for Minority Institutions (NSTI-MI);
  - Motivating Undergraduates in Science and Technology (MUST);

  - Harriett G. Jenkins Predoctoral Fellowship Project (JPFP); and,
  - NASA Administrator's Fellowship Project (NAFP).
- University Research Centers (URC); and
- Tribal /Small Project Collaborations.

- Education's partnership initiatives achieve synergy among participating organizations and leverage the resources and external expertise of these organizations to achieve planned outcomes with greater efficiency. By clustering projects, opportunities for leveraging and synergy can be maximized.

Background:

- Three major projects within the Higher Education and MUREP were restructured in FY 2008 to refocus project activities to address an increasingly diverse student population in a manner that is focused and aligned with Agency workforce needs.
- Beginning with FY 2007, three longstanding projects were realigned from MUREP to Elementary & Secondary Education, a significant difference from prior years.
- In FY 2006, the Office of Education restructured the Partnership Award for the Integration of Research into the Undergraduate STEM Curriculum (PAIR) and combined it with the Curriculum Improvement Partnership Award (CIPA) (both MUREP projects) to create the Curriculum Improvement Partnership Award for the Integration of Research (CIPAIR) project, effective FY 2008. A solicitation is planned for FY 2008 for the new CIPAIR project.

QUESTION 214:

Why is this restructuring necessary?

ANSWER:

- Projects within MUREP, and in fact across the Agency Education portfolio, have been restructured to be more focused and aligned with Agency future workforce needs. In doing so, opportunities to achieve greater efficiencies and impact have been sought. This approach is both fiscally responsible and effective in minimizing the impact of budget reductions.

QUESTION 215:

How will this restructuring affect NASA Education's commitment to diversity?

ANSWER:

- Diversity is an underlying and unwavering core principle of the Education Strategic Coordination Framework. NASA strives to ensure that underrepresented and underserved students participate in NASA research and education programs, and to encourage more of these students to pursue STEM careers. This occurs at all stages of the education pipeline, from informal and elementary and secondary education, through higher education efforts.

- NASA is seeking improved efficiencies in managing projects. One strategy for minimizing the impact of budget cuts to the MUREP program will be an aggressive attempt to increase the participation of minority-serving institutions in the Space Grant College and Fellowship Program consortia and EPSCoR program.

QUESTION 216:

What strategies are being developed for Space Grant investments to support MUREP students and/or institutions?

ANSWER:

- The cultivation of diversity is both a management philosophy and core value for all NASA education efforts. Accordingly, NASA Education strategies for Space Grant support of MUREP students and/or institutions include the following:
    - Through the annual Space Grant budget call, NASA will stress the importance of consortia developing meaningful partnerships with MSIs.
    - NASA will encourage the establishment of joint proposals between Space Grant consortia and MSIs.
    - Consortium-level projects will focus on MSIs or underrepresented groups.
    - NASA will utilize the Space Grant Diversity Working Group to identify and share best practices as well as lessons learned regarding Consortium-level projects focusing on MSIs or underrepresented groups.
    - The Office of Education will provide opportunities for MSIs to highlight their capabilities during NASA events.
    - The Office of Education will encourage MSIs to seek partners within the Space Grant Network for the upcoming University Research Center solicitation.

Space Grants

QUESTION 217:

The NASA budget for FY 2009 requests $28.7 million for Space Grants. Can you give us a breakdown on how that money will be spent?

ANSWER:

- National Space Grant College and Fellowship Program is a national network of colleges and universities that works to expand opportunities for students and faculty to understand and participate in NASA's aeronautics and space programs by supporting and enhancing science, and engineering education, research, and public outreach programs.

- As with all projects, the request includes the agency administrative full costs that include corporate general and administrative, which are determined by the Chief Financial Officer, as well as project-specific costs. Funds will be apportioned to the Space Grant consortia in a pro rata manner consistent with 35 Designated consortia and 17 Program Grant/Capability Enhancement consortia. Final allocations are dependent upon the passing of the NASA Appropriation and subsequent approval of the NASA Operating Plan.

- Each Space Grant Consortium implements a program to best meet the needs of that state. Typically, activities include funding student interns and scholarships, sponsoring university research, providing seed money for student teams in competitions, providing K-12 and informal education support, and providing public outreach and awareness about NASA's mission and the NASA activities occurring within the state.

QUESTION 218:

What programs are being cut or terminated?

ANSWER:

- Mandatory funding amounts for fellowships and scholarships for each consortium would be reduced proportionately.

- Additionally, through the annual Progress Report and Proposal/Budget submission, the 52 consortia would determine which of their consortium projects would be reduced or terminated based on available funding while remaining in alignment with the NASA Education Strategic Framework, outcomes, objectives, and measures. The annual call for Progress Reports and Proposals/Budgets typically occurs in early spring and is dependent upon the passing of the NASA Appropriation and subsequent approval of the NASA Operating Plan.

QUESTION 219:

The FY 2009 budget is $14M less than was appropriated in FY 2008. Now that you have given funding to two tiers of alliances – do you take from Space Grants and still maintain your $7.6M for administrative costs, or you are planning to cut funds to Space Grants after you have upgraded the alliances to the second tier of budgeting?

ANSWER:

The Space Grant budget (in direct dollars) between FY 2008 enacted ($35.6M) and FY 2009 request ($28.7M) decreases by $6.9M million. In direct dollars, Space Grant funding for FY 2008, for the two tiers of alliances, supports the 35 Designated consortia at $730K for each state and funds the 17 Program Grant/Capability Enhancement consortia at $535K for each state. FY 2008 operating costs for the program are approximately $1M.

The FY 2009 request assumes approximately $600K for each of the 35 Designated consortia and approximately$400K for each of the 17 Program Grant/Capability Enhancement consortia. The FY 2009 request includes no "indirect" NASA costs, but does include, as in FY 2008, approximately $1M for operating costs.

CLIMATE CHANGE

QUESTION 220:

As our understanding of the climate system improves, will we ever be able to reduce the funding required for space-based observation systems, or are these operational requirements for which we need to continue planning over the long-term?

ANSWER:

The complexity of Earth's climate and related systems and the nature of and societal concerns over global change are such that long-term space-based observation is required. Distinguishing trends from variability, and human-induced from natural causes of climate change, for example, require observation over multiple 11-year solar cycles. In addition, observations made for scientific purposes have proven valuable in practical applications such as improving severe storm track forecasting, wildfire monitoring, agriculture, and disaster recovery, leading to calls from diverse users for continued observation. Thus the National Research Council's decadal survey report Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond (NRC, 2007) identified and prioritized those needs at least through 2020, and called for a strategy to obtain long-term observations to meet national needs.

There are mitigating strategies, however. What we have learned in developing the current suite of Earth observing satellites is enabling us to develop future systems at lower cost. For example, NASA is now able to procure standard research satellite platforms from commercial industry rather than develop a new, unique platform for each new mission. We are also investing in instrument technology development to make the next generation of satellite instruments smaller and cheaper to deploy. Finally, NASA need not make forever all the measurements it is making now; many can be migrated to operational observing systems that can meet both research and operational needs, though much work remains to demonstrate an efficient and economical transition process.

QUESTION 221:

Is the current mix of investments giving us maximum value out of the observations we are paying for? For example, if you had another $50 million to invest, would the taxpayers get more value from additional investments in satellite sensors, in improved data management, or out of using the currently available data for programs and other decision-making?

ANSWER:

In its FY 2009 budget request, NASA believes it has struck the right balance of investment among scientific research, observing systems, technology development, data management, and applications research. The optimal use of additional budgetary resources is a different question. How NASA would use an additional $50M would depend on whether this was to be provided for a single fiscal year or could be expected on an annual basis for some years. In the former case, the optimal use might be to retire development risk on the first few new missions recommended by the NRC Decadal Survey, thereby accelerating their implementation. In the latter case, a roughly equal investment in satellite missions and research (scientific and applied) might best accelerate progress.

QUESTION 222:

In your view, do federal agencies, states, and other potential users have sufficient technical and other resources to be able to use NASA observations to maximum advantage? If not, how do we improve the usefulness – and expand the use – of these data sets?

ANSWER:

NASA's Applied Sciences Program currently works with 7 U.S. Department of Agriculture agencies, 4 National Oceanic and Atmospheric Administration branches, 4 Department of Interior Agencies, The Department of Transportation Federal Aviation Administration, the U.S. Agency for International Development, the Naval Research Laboratory, the Department of Homeland Security, the Centers for Disease Control, and the Federal Emergency Management Agency, in addition to state/regional organizations, international groups, and developing countries. Virtually no state and local agencies, and few Federal mission agencies, have the technical and financial resources to utilize NASA observations for applications purposes without close and active collaboration with, and assistance from, NASA. (It should be remembered that the NASA data *are* being fully exploited for their original research purposes through the NASA-funded R&A program as well as research programs funded by other federal agencies). In particular, the volumes of satellite data are large, and the algorithms needed to transform the remotely sensed data to focused, efficiently usable products are complex.

One objective of the NASA Applied Sciences program is thus to bridge the technical information system divide between NASA and other federal, state, local, and tribal mission agencies. The Applied Sciences program discovers and demonstrates new uses for NASA observations and research through close collaboration - the needs of the mission agencies are identified, their capabilities are determined, and tailored end-use products are developed and refined through actual trial. This collaborative development requires that NASA partner with agencies that have mandates and means to provide public services on a continuing (operational) basis. NASA is evaluating how its Applied Sciences Program can better support its partner agencies through stronger linkages and communications with our partners, as well as improved project models and solicitations. Improving NASA's Applied Sciences

Program is, however, only a partial solution—recipient agencies must also command sufficient resources to utilize our observations and scientific results on an extended basis following the initial trial period.

ENHANCED USE LEASE AUTHORITY

QUESTION 223:

How do you expect to use NASA's enhanced use leasing authority in FY 2009?

ANSWER:

EUL improves the agency's performance by allowing NASA to recover asset values, reduce operating costs, improve facility conditions, and improve mission effectiveness. In FY 2009, NASA Headquarters will work with all the Centers to assist them in developing enhanced use leases for their underutilized real property. The use of the authority in FY 2009 will depend on the complexity of proposed leases and whether negotiations can be completed in FY 2008 and FY 2009. The two NASA Centers that have had enhanced use lease authority under the demonstration program – NASA Ames Research Center and Kennedy Space Center – are already working on leases that will likely be awarded in FY 2009. For the other Centers, it will be dependent on the ability to find appropriate tenants and to negotiate a lease.

QUESTION 224:

Where are cash proceeds deposited – in the Treasury or NASA's capital asset account?

ANSWER:

The cash proceeds received and not utilized to cover the full costs to NASA will be deposited in a capital asset account established by the Administrator.

QUESTION 225:

If they are deposited in the capital account, are they available absent a subsequent appropriation?

ANSWER:

Yes, under the terms of the statute, the funds in the capital account are available without the requirement for a subsequent appropriation.

QUESTION 226:

What does NASA expect the net "profit" to total in FY 2009?

ANSWER:

The revenue receipts that can be forecast for FY 2009 are for those leases that we have already entered into. The revenue received in FY 2007 was approximately $6.8M. This amount includes the value of in-kind consideration received by the two demonstration Centers. We hope to improve on that amount with new leases in FY 2008 and FY 2009. The "profit" derived from these revenues will be dependent upon the amount of the full costs to NASA in connection with the leases.

QUESTION 227:

What are some examples of successful uses so far?

ANSWER:

The total spent on projects in FY 2007 was approximately $970 thousand. It should be recognized that, in FY 2007, funds could be spent on maintenance projects, as well as capital asset projects.

Examples of FY 2007 projects include:
- Bldg. 2/Ames Research Center: Building safety and code assessment
- Bldg. 18/Ames Research Center: Installation of AC units
- Bldg. 18 &19/Ames Research Center: IT Network support
- Bldg. 18/Ames Research Center: Electrical work
- Bldg. 18/Ames Research Center: Communication Closet Relocation Project
- Bldg 20/Ames Research Center: Repairs to historic structure
- Shuttle Landing Facility/Kennedy Space Center: Bird Deterrent System
- Ames Research Center: Demolition of lead-based structures

Satellite-based observations

QUESTION 228:

In responding to a recommendation of the National Academy's Decadal Survey, what is NASA doing to integrate and complement satellite-based observations with socio-economic data collected and analyzed in other agencies? Could NASA boost the value of the NASA data by working more closely with decision-making agencies and offices, rather than primarily research offices?

ANSWER:

NASA supports integrating and complementing satellite-based observations with socioeconomic data for decision-making. The NASA-supported Socio-Economic Data and Applications Center (SEDAC) assembles socio-economic data from Federal and international agencies, and transforms these data into forms that can be more easily integrated with satellite-based data. SEDAC also develops and disseminates key integrated data products that combine remote sensing and socioeconomic data to address interdisciplinary phenomena such as urbanization, natural disaster risks, vulnerability to climate change, and environmental sustainability. Value-added products produced by SEDAC include the Global Rural-Urban Mapping Project, which uses nighttime lights in combination with SEDAC's Gridded Population of the World to model urban population distribution, and the 2008 Environmental Performance Index, which combines satellite, modeled, and *in situ* data to measure the environmental performance of 149 countries.

NASA works with many agencies that utilize satellite observations for decision-making. These agencies include the Departments of Agriculture, Health and Human Services, Transportation, and Homeland Security. Through these collaborations, NASA improves its awareness of information required by stakeholders, which may be satisfied from satellite measurements, and NASA focuses future research to improve data products for decision-making.

QUESTION 229:

How should priorities be set among competing demands to acquire and maintain data sets among all physical science and socio-economic possibilities? Which agency, or what kind of a body, should lead such coordination and prioritization for science and socio-economic data?

ANSWER:

Demands for physical science and socio-economic data are not competing per se, in that the suppliers and users of each recognize the need for both. The demand for the full range of data required to address the challenges posed by global change does, of course, exceed the supply of funds and therefore priorities do need to be established. Rather than attempt to prioritize among widely different data science and socio-economic types (e.g., atmospheric humidity and population density by county), it is more tractable (and helpful) to look at progress toward long-term goals on the time scale of a decade or so, as that is about the right period over which we should design and implement new observing capabilities and assess progress. For Earth science and applications from space, which is the arena of NASA's contribution, the National Research Council (NRC) achieved a broad consensus on priorities with their decadal survey report. NASA is working to implement these recommendations with its partners, including its recommendations regarding suborbital and surface-based data that enhance data collected from satellites.

The broader examination of progress on science and applications related to global change is best performed by the U.S. Climate Change Science Program (CCSP) and parent bodies, which bring together all the relevant federal agencies. The NRC brings broad science and applications expertise to advise the CCSP through such means as the NRC committee which prepared the report its report Evaluating Progress of the U.S. Climate Change Science Program: Methods and Preliminary Results (NRC, 2007), and the standing NRC Committee on Human Dimensions of Global Change, also partially funded by the CCSP.

QUESTION 230:

The Decadal Survey strongly implied that there is additional value to be gained by giving greater attention to the entire chain of the potential usefulness of data, from "observations to research to applications and benefits." What has NASA learned about how its satellite-based observations are being used, or could be used, and what are the obstacles to increasing the value of observations through applications and daily decisions?

ANSWER:

NASA's satellite-based observations are being used across a broad range of applications, including fighting wildfires in California, predicting global agricultural yields, monitoring the transport of aerosols from biomass burning, predicting the path of vector-borne diseases, and assessing vulnerability to invasive species. The demand for NASA's capabilities is growing rapidly.

At NASA's request, the National Research Council (NRC) reviewed the NASA Applied Sciences Program (ASP) and assessed its approach in extending NASA research results to practical, societal applications. The NRC's report praised NASA's overall approach, and provided five recommendations for improvement which are summarized here:

- Extend the societal benefits of the future missions identified in the Decadal Survey by incorporating an ASP representative in NASA's mission design and selection teams (*this recommendation has been fully enacted with the new Decadal Survey missions entering the pre-formulation phase*);
- Assist in the formulation of research to operations transition plans for Earth observations;
- Link data and research to users through two-way communications that involves feedback from users of NASA data;
- Develop processes for sustained interactions with a broader base of users and beneficiaries of NASA observations; and,
- Facilitate effective partnerships with users via direct engagement with a broader variety of users, adding rigor to performance metrics, evaluating the number and focus of applications, improving transparency and documentation of processes, and clarifying and broadening policies for partnership with the private sector.

These recommendations are being actively implemented within the ASP.

QUESTION 231:

How is NASA engaging decision-makers outside of research in setting priorities for observations, and which decision-makers is NASA engaging?

ANSWER:

The priorities for NASA future missions were set by the recent Earth Science and Applications Decadal Survey. By design, the NRC had explicit participation from, and emphasis on, the needs and priorities of both the research and applications communities.

The NASA Applied Sciences Program engages decision-makers in a variety of ways. The NASA program relies, in part, on operational Federal agencies such as EPA, USDA, CDC, and BLM to help reach the state and local levels, where most resource management and environmental decisions are made. Unlike NASA, these agencies have the responsibility, connections, and expertise to serve the needs of the State, local, regional, and tribal agency needs. Decision makers are also engaged through NASA's active participation in regional associations such as the Gulf of Mexico Alliance, where NASA Centers and Headquarters personnel contribute through developing projects that are tailored to the priorities of the association members. Many state, local, and tribal decision-makers become involved through participation in projects selected through NASA solicitations – the solicitations often require partnerships with decision makers.

Deep Space Network

QUESTION 232:

What challenges remain to better align program requirements with agency space communications goals?

ANSWER:

NASA has centralized its space communications activities into a single office at NASA Headquarters – the Space Communications and Navigation (SCaN) office, within the Space Operations Mission Directorate. SCaN is implementing an integrated approach to providing the Agency with seamless, integrated space communication services. SCaN services embrace all of NASA's science, exploration, and human mission requirements, from Earth orbit to deep space. SCaN maintains a tightly coupled dialogue with the Mission Directorates in order to ensure that the space communications architecture remains aligned with approved mission requirements, present and planned. The SCaN Program Office is supported by the SCaN Board of Directors (BoDs), with membership from the Science and Exploration Systems mission directorates, as well as the Office of the Chief Information Officer, Program Analysis and Evaluation, the Office of the General Counsel, and the Office of the Chief Engineer. The Board participates in the decision-making process involving the architecture buildup and its alignment with Agency needs, goals and objectives.

QUESTION 233:

What strategies or plans have been developed, if any, to deal with the deferred maintenance backlog for repairs to Deep Space Network assets?

ANSWER:

NASA has generated a plan to identify the approach needed to reliably maintain and safely operate the Deep Space Network (DSN) for the foreseeable future. This plan addresses the operational and maintenance budgetary and resource requirements to maintain network performance at the "green" level in support of user needs. This DSN "Green Plan" makes use of the Asset Management/Maintenance Improvement program that implements Reliability Centered Maintenance to ensure reliability and system availability. The deferred maintenance backlog and the costs associated with the "Green Plan" are accommodated within the present budget profile. Much progress has been made in addressing and resolving routine and long-term (i.e., upgrades) maintenance issues.

QUESTION 234:

By the year 2020, Deep Space Network is projected to support twice the number of missions it does currently, and one projection noted that the system will reach capacity in 2013. What are the costs and benefits of terminating mission support to some or all "legacy" missions that have remained operational beyond their original lifetimes?

ANSWER:

The Space Operations and the Science Mission Directorates have been studying the various needs of the currently planned science missions out to 2025, and are in agreement that there is no need to cut back on any of current missions in 2013, let alone 2020, due to any projected under capacity of the Deep Space Network (DSN). The consensus is that there is enough capacity in the DSN, as it is currently configured, to maintain contact with all current and currently planned future missions out to 2025.

Every two or three years, in accordance with the NASA Authorization Act of 2005, each of the major science research areas conducts a "Senior Review" of its operating missions to determine their funding priorities. Missions are ranked based on an independent science panel's assessment of the science value per dollar needed to extend the mission. Scientific merit is based upon the extended mission objectives and capabilities which may be different than the prime mission objectives and capabilities. Missions with a high science value are likely to receive funding while missions at the bottom of the list may not.

QUESTION 235:

The Space Communications Plan states that NASA plans to upgrade and develop the Space Communications Program elements so that the space communications architecture will accommodate the changing demand for communications and navigation services. What are NASA's plans to upgrade the program elements?

ANSWER:

NASA is evolving its space communications architecture to accommodate present and future mission requirements. This architecture will form the framework for planning the upgrades and developments to the space communications networks. NASA is expected to complete its architectural roadmaps by December 2008 with a preliminary report due by the end of September 2008. The report will include a technology roadmap and suitable options for evolving the NASA network capabilities to further enable science with integrated Space Communications and Navigation (SCaN) services and much higher data return than presently possible.

NASA is exploring the arraying of ground assets to further maximize capabilities. This concept involves combining multiple antennae in-phase to communicate with spacecraft. This technique will enable NASA to increase the effective antenna aperture size to enhance the ability to transmit and receive data to meet mission needs. NASA is also evaluating optical technology and is developing a plan for building, integrating, and demonstrating optical communications in the near-Earth and deep space environments. Optical communications technology has the potential to provide additional capabilities to the future upgraded DSN radio frequency network configuration, drastically increasing mission data return. However, much technology development and demonstration needs to take place before optical communications can be relied upon to provide operational support. NASA's initiatives will be captured in detail in our December 2008 architecture roadmap report, and will be reflected in the FY 2010 budget request.

QUESTION 236:

When NASA replaces the current Deep Space Network antennas, will there be a gap between systems and if so, what is the timeframe of that gap?

ANSWER:

NASA recently completed a thorough study of the need to replace the existing 70-meter antennas, and whether such aperture size is needed to support future space mission needs. Results of the study determined that the present capabilities are needed, and the best value for NASA is to retain the existing Deep Space Network (DSN) configuration and extend its life to the 2025 time frame. The study team concluded that while other configurations may provide better performance over the long run, it would behoove NASA from a cost perspective to maintain the present system and gradually upgrade its capabilities such that the network configuration will have evolved to similar -- if not better -- capabilities by 2025. As NASA implements these upgrades, it will be possible for to incrementally phase out the 70-meter antennas without any capability gap or any impact to the customer base. The NASA Space Communications and Navigation (SCaN) Program office is working very closely with the Jet Propulsion Laboratory (JPL) to update the DSN "Green Plan" to reflect these conclusions. Additionally, NASA is working hard to build capabilities to allow for more Operations and Maintenance (O&M) efficiencies. This will potentially result in substantial O&M savings that SCaN will leverage into future DSN capability upgrades.

In addition to the upgrade of the DSN antenna capabilities, NASA is working to evaluate and evolve optical communications for its growing operational needs. The Agency is developing a plan allowing for the build-up of optical payloads suitable for near-Earth and deep space operations. NASA is investigating demonstrations of capabilities in the Lunar environment and potentially on one of its Outer Planets flagship missions. The Agency expects to first demonstrate, and gain operational experience with, optical technology before adopting it for its operational needs. NASA expects that the significantly higher data rate capability of optical communications has the potential to accelerate the deep space science and exploration programs. Results of our study may be briefed upon request.

QUESTION 237:

In NASA's FY 2007 Annual Performance Report, the Program Improvement Plan for the Space and Flight Support Theme included identifying budget impacts for the Space Communications Program to meet changing requirements for human and robotic space communication from the Space Shuttle retirement through human lunar operations. Additionally NASA would develop a plan for the most cost effective way to sustain necessary capabilities, track performance and efficiency, and meet changing lunar operations requirements. Actions on these items are not expected to be completed until March 30, 2009.

a. What is the progress of identifying budget impacts for the Space Communications Program?

ANSWER 237a:

NASA is presently evolving its architectural and technology roadmaps, with a preliminary report due by September 2008, and a final report by December 2008. These roadmaps will identify implementation options suitable to meet the evolving science mission needs, including those of near Earth, Lunar, and deep-space science and exploration programs. The architecture buildup will be done in interlocking capability modules that will grow alongside the mission needs of the Agency. NASA will also formulate a cost-effective acquisition strategy. NASA's approach will leverage the remapping of priorities, instituting efficiency and leveraging savings to offset some of the budgetary requirements. The Agency will complete its roadmaps later this year, and potential budgetary impacts will be reflected in the FY 2010 and future Budget Requests.

QUESTION 237b:

What is the progress of plan development on cost-efficient ways to sustain capabilities, track performance, and meet changing requirements?

ANSWER:

NASA is developing plans to modernize existing systems and develop capabilities that will reduce the operations and maintenance cost of the SCaN operational networks through an integrated services approach to support its mission planning model. A Systems Engineering team has been assembled to develop the integrated network architecture; a first draft is anticipated September 2008 with a final plan by the end of the year.

QUESTION 237c:

What are some of the alternative architectures that NASA is considering, such as Deep Space Network Arrays of smaller antennas?

ANSWER:

NASA recently completed a thorough study of the need to replace the existing 70-meter antennas, and whether such aperture size is needed to support future space mission needs. The study considered a range of options for continuing 70-meter-class capability beyond 2015, with various permutations, including retention of existing assets, arraying of new and existing antennas, and transition to optical communications (please see response to question #237).

QUESTION 238:

In NASA's FY 2009 Budget Estimate, the agency notes that it will be transferring the Deep Space and Near Earth Networks from the Heliophysics theme with in the Science Mission Directorate to the Space and Flight Support theme within the Space Operations Mission Directorate.

a. What does NASA hope to gain from centralizing its Space Communications and Navigation activities within the Space Operations Mission Directorate?

ANSWER:

The consolidation of communications programs within the Space Communications and Navigation (SCaN) program in SOMD will enable NASA to realize greater efficiencies from the centralized management of the Agency's communications assets, savings from the elimination of redundant equipment across the program, and the more cost-effective procurement of support equipment. These savings may then be reinvested into maintenance and repair activities that will allow the Agency to continue operating critical assets in the near term even as it looks to upgrade and replace current systems to better support future NASA space and Earth science missions.

QUESTION 239:

The NASA Authorization Act of 2005 (P.L. 109-155) directs that at least 15 percent of funds for research on the International Space Station must be devoted to topics other than the human exploration program. What is the percentage of such research funding in the proposed budget for FY 2009?

ANSWER:

The total ISS Research Funding for 2009 is $168.0M, of which $138.0M is towards Exploration Research and $30.0M is towards Non-Exploration Research. This translates to 18 percent of the total funds being spent on topics other than the Human Exploration Program (P.L 109-155 directs this amount be at least 15 percent).

QUESTION 240:

Are these research funds awarded through peer-review of proposals submitted by researchers? If so, what is the success rate of those proposals, and how does it compare to proposal success rates in other NASA research programs?

ANSWER:

As a general rule, NASA peer reviews all intramural and extramural research. This is also true for non-exploration research funded under the directions of the NASA Authorization Act of 2005 (P.L. 109-155). NASA used some of the funds designated by the 2005 Authorization Act to complete some the peer-reviewed fundamental (non-exploration) research that had been previously recommended for termination by the Exploration Systems Architecture Study (ESAS).

On December 5, 2007, NASA released NASA Research Announcement soliciting fundamental spaceflight rodent research on the Russian Bion M1 2010 free flyer opportunity. On March 13, 2008, NASA released a pre-solicitation notice for a Stand Alone Missions of Opportunity Notice Announcement which includes Fundamental Space Biology opportunities.

NASA issues research announcements that are open to research community in the United Stated. Depending on the focus of solicitation, NASA receives approximately 150-200 proposals. Our selection rate is 10-15 percent of the proposals solicited, which is comparable to other Federal agencies.

Development of Future Exploration Systems

QUESTION 241:

If NASA receives an additional $1 billion in fiscal years 2009 and 2010 to accelerate the development of Orion and Ares I, what will NASA do with the additional funding?

a. For example, how will the additional funding specifically help you address development challenges related to the thermal protection system, the launch abort system, landing system, and the J-2X engine?

ANSWER:

An additional $2.0B ($1.0B in FY 2009 and $1.0B FY 2010) directed towards accelerating the development of Orion and Ares I would support the Constellation

Program (CxP) budget at a 65 percent cost confidence level for a 2013 launch, instead of the current 65 percent cost confidence level for the 2015 Initial Operational Capability (IOC) date. We are currently working to a 30 percent cost confidence number for an aggressive, internal 2013 IOC date. Essentially, the given work for the Orion design and for testing of the Orion and Ares-1 is the same for either a 2013 or a 2015 date – the difference is the resources that can be applied to affect the rate at which work is accomplished. An additional $2.0B in funding, if provided in time ($1.0B in FY 2009 and $1.0B in FY 2010), would allow the Program the flexibility to apply additional resources to problems as they arise, and increase the likelihood of achieving IOC in 2013 from 30 percent to 65 percent.

QUESTION 242:

When will final program requirements for Orion and Ares I be established?

ANSWER:

NASA has completed substantial work defining the requirements, design, cost and schedule estimates for the Ares I and Orion projects. These will continue to mature through the formulation phase of both projects. Formulation ends and the implementation begins at Key Decision Point C, which occurs after the Preliminary Design Reviews, scheduled to occur in late Fall 2008. For the formulation phase, Ares I and Orion have already successfully held two major reviews – Systems Requirements Review (SRR) and Systems Definition Review (SDR) to ensure each is prepared to complete the formulation phase. While not finalized, key Ares I and Orion requirements are stable, as is evidenced by the fact that their respective Systems Requirements Documents were recently approved.

QUESTION 243:

In the past NASA's program cost estimates have not been very reliable. How reliable are the cost estimates for the Orion Crew Exploration Vehicle and Ares I Crew Launch Vehicle? If not, when can we expect a credible estimate of the program cost?

ANSWER:

NASA feels that the cost estimates performed on Ares I and Orion are reliable. The cost estimating approach used was based on a parametric estimation and cross-checked. Cost estimates are refined in conjunction with the evolving design analysis cycle efforts, therefore as the design matures, so does the accuracy of the cost estimate.

QUESTION 243a:

Is the development of reliable cost estimates dependent on the completion of Orion and Ares I requirements?

ANSWER:

The cost estimate accuracy improves as the maturity of the design increases. NASA expects to have baselined cost estimates for the Ares and Orion projects by Preliminary Design Review (PDR) in preparation for the Key Decision Point C (KDP C) in late fall or early winter 2008.

QUESTION 244:

NASA's space flight program and project management requirements (NPR 7120.5D) state that the project should have a preliminary life cycle cost estimate by the end of Phase A of the development lifecycle (System Definition Review/ Pre Non-Advocate Review). Given that both the Ares and Orion have completed their respective System Definition Reviews, what is the preliminary lifecycle cost for each of the projects?

ANSWER:

The Agency is in the process of determining the preliminary lifecycle cost estimates for both Ares I and Orion. Both projects are still in the formulation stage where engineering and design options that will affect the lifecycle cost are being considered and traded. While each project has conducted its System Design Review, full completion of the Key Decision Point (KDP) "B" milestone has not yet occurred. The approval to continue to Phase B, given to Ares I by the Agency Level Program Management Council (APMC) on March 5, 2008, was made pending resolution of the independent cost estimate assumptions versus the Ares I Project Office cost estimate. Resolution of this outstanding item for Ares I will constitute the completion of the KDP-B milestone. The Agency will then be able to provide a preliminary life cycle cost estimate for Ares I. We estimate completion of this action in late spring 2008. The APMC reviewed the Orion project in late April 2008. The Orion project is resolving items resulting from the Agency-level review. Therefore, full completion of the KDP-B milestone for Orion should occur this summer, and thus, the preliminary lifecycle cost estimate should be available at that time.

QUESTION 245:

What level management reserves have been set aside for the Ares I and Orion programs? What do you expect the reserves to be used for?

ANSWER:

The Constellation Program carries reserves at the program rather than project levels. The Constellation program is carrying $4.9B of reserves through FY 2013 (approximately 21 percent against program content through that same period) to protect an Initial Operational Capability (IOC) of March 2015 at 65 percent cost confidence. Reserves will be used to resolve technical and schedule issues that occur during development for Ares 1 and Orion, as well as other projects such as Ground and Mission Operations that are developing content for IOC.

QUESTION 246:

The NASA Administrator has stated that the thrust oscillation problems reported about the Ares I are not uncommon in the development of lift vehicles. Can you discuss these concerns with us and your progress in addressing them? What are implications of correcting the problem i.e. weight growth, cost growth, schedule delay?

ANSWER:

During the Ares-I System Definition Review (SDR) in October 2007, thrust oscillation was identified as a potential impact to the integrated Ares/Orion stack. In November 2007, NASA chartered the Thrust Oscillation Focus Team (TOFT) to:

- Review the forcing functions, models and analysis results to verify the current predicted dynamic responses of the integrated stack;
- Identify and assess options to reduce predicted responses;
- Validate and quantify the risk to the Ares I vehicle, Orion spacecraft, crew, and other sensitive subsystems and components to the extent allowed by the Ares I/Orion design maturity; and,
- Establish and prioritize mitigation strategies and establish mitigation plans consistent with the Constellation integrated schedule.

Between November 2007 and March 2008, the TOFT assessed vehicle system impacts due to thrust oscillation and defined potential solutions to mitigating the impacts. This includes review of thrust oscillation impacts on the Orion, upper stage, J-2 engine, reaction control system, first stage, and avionics. The need to work with across systems in an integrated fashion and identifying possible scenarios and their corresponding sensitivities is key to mitigation planning.

From a design perspective, it was beneficial to identify this early in the development process, allowing solutions to be implemented before Ares and Orion enter the detailed design phase. NASA has followed a classic systems engineering approach in addressing this issue – brining in a diverse set of experts, identifying root causes, understanding sensitivities, investigating parallel mitigation paths and implementing solutions based on risk. As a result, we have a much better understanding of stack dynamics and internal motor flow dynamics, which is unprecedented, this early in a development program. If left unmitigated, the Orion would have the majority of the impacts, Ares-I 1st stage and upper stage engine have no issues and upper stage could require some minor modifications.

QUESTION 247:

Is a 2015 date for initial operating capability a realistic one given the considerable technical unknowns in the program?

ANSWER:

NASA remains committed to a March 2015 IOC if full funding is secured for the President's FY 2009 budget submit. Budget stability in FY 2009 is crucial to maintaining a March 2015 Initial Operational Capability (IOC) for the Orion Crew Exploration Vehicle and Ares I Crew Launch Vehicle. There is minimum flexibility through 2010, so Congressional support for budget stability is critical.

NASA has planned and paced the multi-decade Constellation program to live within its means, while carefully identifying and mitigating the threats to mission success. NASA is committed to being a wise steward of taxpayer dollars by maintaining our schedule and meeting our milestones for the budget we have identified. Within the Constellation program, NASA is making important decisions to stay within budget and on schedule by striving for the lowest life-cycle cost possible. NASA has established an initial plan for Constellation's designs and integrated flight tests to ensure that the Agency adequately tests systems prior to their operational use and allows appropriate time to implement critical lessons learned from these tests.

Determining confidence levels regarding project cost and schedule success is a major function of a Program manager and a standard part of the program management process. Program managers constantly weigh schedules against available resources and recommend adjustments, as necessary, in order to achieve established program milestones. This past year NASA has performed a cost confidence level analysis and is now embarking on performing a schedule confidence analysis effort to better understand the Agency's success in meeting the defined schedule. The analysis will identify the probability of achieving the current schedule and identify the required contingency to account for any schedule uncertainty. The cost confidence analysis performed by the Constellation Program states that an IOC or March 2015 can be achieved with 65 percent confidence.

QUESTION 248:

What progress is NASA making in addressing GAO's concerns on the need for more robust testing facilities?

ANSWER:

NASA has begun construction of the A-3 test stand at Stennis Space Center to be used for reduced atmospheric pressure testing of the J-2X engine. A total of 326 vertical piles will be driven 85 to 90 feet in the ground and will be reinforced by 102 battered or inclined piles designed to provide horizontal stability. Diffuser performance during J--2X mainstage operation was successfully demonstrated in Subscale Diffuser testing. The system achieved 0.07-psia vacuum pressure, well below the maximum limit of 0.16.

QUESTION 249:

Has NASA decided on the means of landing the Orion (i.e. water or land landing)? If so, please discuss this selection and the impact on reuse of the vehicle.

ANSWER:

A final decision on the landing mode for Orion has not yet been made. Analysis of the landing options is actively being pursued at this time. The current Point of Departure architecture for the analysis leading to the Orion Preliminary Design Review (PDR) assumed a nominal water landing. However, NASA continues to assess how to best protect the crew during contingency landings on land. As the contingency land and water landing systems are better understood, NASA will readdress the nominal landing mode. A final decision is expected no later than the PDR, which is scheduled to occur in fall 2008.

It is important to note that throughout the early conceptual design efforts, NASA has been working hard to minimize life-cycle costs of building and flying Orion. We operate with the assumption that we will reuse hardware as much as possible when it is feasible and cost effective to do so. For land landings, we assume that much of the Orion crew module may be reusable. One example of something that is not reusable is the ablative heat shield which, by design, will partially erode away during a normal reentry. Some of the associated heat shield attachment hardware, however, may be reusable.

The Orion Project will continue to evaluate the overall reusability of the crew module as part of the decision on nominal landing mode. Saltwater and land landing implementations pose different reuse issues. NASA is still working to understand just what components could be reused after a water landing. The Agency will continue to examine ways to maximize re-use when and where it makes economic sense.

Completion of the International Space Station

QUESTION 250:

How much will it cost to complete the construction of the International Space Station? Please break this out by assembly, shuttle and sustainment.

ANSWER:

The total direct budget for the International Space Station from FY 2009 through FY 2010 (the remaining two years before completion of assembly) is $7B. This includes $0 for development costs, $3B for operations and utilization, $1B for cargo and crew transportation, and $3B for Shuttle transportation (booked in the Space Shuttle program).

QUESTION 251:

How much will cost to sustain the International Space Station after the retirement of the shuttle in 2010 and through its planned retirement in 2016?

ANSWER:

The budget horizon for the FY 2009 President's Budget Submit runs through FY 2013; for FY 2011-2013, in the post-Shuttle environment, the International Space Station budget comes to a total of about $6.8B. This amount covers Station operations and research.

QUESTION 252:

Does NASA plan to expand International Space Station operations beyond 2016?

ANSWER:

NASA's current outyear budget plans do not include funding to operate the ISS beyond 2016, but the Agency is taking no action to preclude ISS operations beyond 2016. Future decisions on the end-date for ISS operations will be based on discussions with the ISS international partners, progress toward the President's Exploration goals, and the affordability of projected ISS operations costs.

QUESTION 253:

Does NASA have an estimate of the cost to decommission the International Space Station?

ANSWER:

No, NASA has not generated a cost estimate for the decommissioning of ISS at this time.

QUESTION 254:

How confident are you that the commercial space sector to develop, produce, and launch transport vehicles that can take equipment and crew to and from the Space Station during the gap between the Shuttle and Orion? What is the status of these efforts?

ANSWER:

NASA is confident in the ability of U.S. industry to develop both cargo and crew transportation capabilities that will be able to support the International Space Station. The major uncertainty will be the schedule and cost of developing such capability. Industry responses to the recent Request for Proposals (RFP) for commercial cargo resupply will provide a definitive reference for the cost of such services. NASA's plans allow for a longer development period than the contractors are currently advertising.

Crew transportation will be a more difficult job because of the safety and mission success assurances needed to transport crew. The Agency is funding the Commercial Orbital Transportation Services (COTS) effort to encourage development of cargo delivery capability. There are currently two funded COTS demonstrations, and five unfunded Space Act Agreements under the effort. The RFP for commercial cargo was released last month with proposals due in June. The commercial companies have asked for an extension of the proposal due date. Cargo opportunities on partner launch vehicles, and the spares that could potentially be delivered by the two Shuttle contingency flights before 2010, would allow NASA to support the ISS even if commercial cargo services are delayed beyond the current desired need in 2010. The Agency has no active back up plan for commercial cargo, but is relying on passive pre-positioning, limited access on partner-funded vehicles, and ISS degradation until commercial cargo comes on line. This strategy demonstrates NASA's confidence in the development of commercial cargo capabilities.

For crew transportation, NASA sees no immediate option other than procuring Soyuz. The Agency fully supports commercial crew transportation, but sees this as a more difficult task requiring additional time for the capability to develop. Even the most optimistic commercial projections will require Soyuz transportation. Therefore, NASA is seeking relief from the provisions of the Iran, North Korea and Syria Nonproliferation Act (INKSNA) to use Soyuz until the Orion Crew Exploration Vehicle or a U.S. crew transportation system is available.

QUESTION 255:

How confident are you that these commercial vehicles will be available to support the space station?

ANSWER:

NASA is confident in the ability of U.S. industry to develop both cargo and crew transportation capabilities that will be able to support the International Space Station. The major uncertainty will be the schedule and cost of developing such capability. Industry responses to the recent Request for Proposals (RFP) for commercial cargo resupply will provide a definitive reference for the cost of such services. NASA's plans allow for a longer development period than the contractors are currently advertising.

Crew transportation will be a more difficult job because of the safety and mission success assurances needed to transport crew. The Agency is funding the Commercial Orbital Transportation Services (COTS) effort to encourage development of cargo delivery capability. There are currently two funded COTS demonstrations, and five unfunded Space Act Agreements under the effort. The RFP for commercial cargo was released last month with proposals due in June. The commercial companies have asked for an extension of the proposal due date. Cargo opportunities on partner launch vehicles, as well as spares that could potentially be delivered by the two Shuttle contingency flights before 2010, would allow NASA to support the ISS even if commercial cargo services are delayed beyond the current desired need in 2010. The Agency has no active back up plan for commercial cargo, but is relying on passive pre-positioning, limited access on partner-funded vehicles, and ISS degradation until commercial cargo comes on line. This strategy demonstrates NASA's confidence in the development of commercial cargo capabilities.

For crew transportation, NASA sees no immediate option other than procuring Soyuz. The Agency fully supports commercial crew transportation, but sees this as a more difficult task requiring additional time for the capability to develop. Even the most optimistic commercial projections will not obviate the need for Soyuz transportation. Therefore, NASA is seeking relief from the provisions of the Iran, North Korea and Syria Nonproliferation Act (INKSNA) to use Soyuz until the Orion Crew Exploration Vehicle or a U.S. crew transportation system is available.

QUESTION 256:

What is the status of the MOU negotiation with National Institutes of Health (NIH) for conducting scientific experimentation on-board the International Space Station?

ANSWER:

The National Institutes of Health (NIH)-NASA Memorandum Of Understanding (MOU) for Cooperation in Space-Related Health Research was signed on September 11, 2007, and featured in the Fall 2007 issue of NIH's *Medline* magazine in the article "*Space: The Next Medical Frontier.*" The NIH has since informed NASA of plans to issue a research announcement in FY 2008 regarding opportunities on the ISS.

QUESTION 256a:

Are there any other agencies or other organizations that have expressed interest or are pursuing similar negotiations?

ANSWER:

As reported to the Congress in April 2007, NASA has three tactical initiatives underway to identify and enter into agreements with non-NASA entities for use of the ISS in the post-assembly timeframe.

Under the education initiative, the NASA Education Office is in the final stages of completing a second report to Congress as requested in Section 2006b of the America Competes Act. This is an interagency report that NASA, National Institutes of Health, National Science Foundation, Department of Energy, and Department of Defense completed to identify potential, specific educational projects that involve use of the space station. The Department of Education has participated in the development of this report and is preparing an accompanying statement that warrants the validity of these educational projects for advancing progress in Science, Technology, Engineering, and Math (STEM) education in accordance with national policy.

Under the basic research initiative, NASA continues to meet with, and cooperatively provide information to, other government agencies (OGAs) interested in utilization of the ISS. It is anticipated that these discussions will soon lead to MOUs for use of the ISS that are similar in scope to the MOU signed by the NIH and NASA in September 2007.

Under the applied research initiative, NASA issued an Announcement of Opportunities for use of the ISS by U.S. non-government entities for R&D purposes in August 2007. The proposals received were evaluated during fall 2007, and NASA decided to pursue development of three Space Act Agreements (SAAs) as a result. The potential agreements, which involve the exchange of proprietary information that cannot be discussed at this time, are with two private firms and one university. We anticipate concluding these agreements in Spring 2008 and are in the process of establishing a pilot program to test the experiment hypotheses and business models as proposed. In addition, NASA is continuing to cooperatively exchange information on ISS R&D opportunities with private firms and non-profit institutions that have displayed an interest in ISS utilization. It is expected that these discussions may lead to private initiatives to form institutes or consortia for ISS utilization. Along these lines, the U.S. Chambers of Commerce, Space Enterprise Council plans to host a May 2008 meeting at its headquarters in Washington D.C., specifically for the purpose of discussing ISS National Lab opportunities. The top 100 U.S. corporate R&D investors will be invited to attend.

The education, basic, and applied research initiatives are all progressing well and non-NASA interest in utilization of the ISS continues to grow, as predicted, with the completion of each new assembly flight and the resultant reduction in perceived risk.

QUESTION 257:

What are NASA's projections for future cost of services from the Russians?

ANSWER:

At this time, it is premature to speculate on the cost of any future contract with Russia to provide crew transport and rescue services. To meet our U.S. obligations for U.S., Canadian, European and Japanese crew, we would require six seats per year. The total would depend on when a U.S. capability is operational.

Retirement of the Space Shuttle

QUESTION 258:

Why have the resources needed to accomplish transition not been quantified in NASA's budget thus far?

ANSWER:

The in-year resources (i.e., those from FY 2006-10, the end of the Space Shuttle Program) are already incorporated in the Space Shuttle Program budget line. The outyear costs (i.e., those from FY 2011-2015) for Transition and Retirement (T&R) activities are being generated now as part of the formulation of the FY 2010

President's Budget Request. The budget projection will benefit from trade studies and "what-if" exercises conducted since the development of the FY 2009 request, and will reflect an increasingly mature understanding of Constellation Program requirements. Every time NASA has projected outyear T&R costs, the numbers have decreased. Thus, the Agency does not want to commit to a firm set of outyear numbers, since data and trends indicate that transition and retirement costs will be *lower* than the estimate from 2007. In not "locking in" higher projections, NASA hopes to incentivize people to find the best methods and approaches for the Agency.

QUESTION 259:

The initial reported estimates of transition and retirement costs were over $4 billion. Recent reported estimates have been as low as $500 million. Please explain the drastic reductions in estimated transition and retirement costs.

ANSWER:

NASA had an early estimate for Transition and Retirement (T&R) costs of $3.5B, covering FY 2006-2015; more recent estimates, such as the $1.2B estimate generated in 2007, include FY 2011-2015 only. The Agency is currently generating new T&R outyear projections as part of the FY 2010 budget formulation process, and these are expected to be less than the 2007 estimate. In part, this is because NASA's understanding of the Constellation Program's requirements is continuing to mature. One example of this is the degree to which Shuttle property and facilities will be reused by Constellation; the more property is reused, the lower the Transition and Retirement (T&R) cost for FY 2011-2015. This increasing understanding is helping to improve the fidelity of NASA's projections. In addition, the $3.5B estimate used two-year-old data with conservative assumptions and parametric computer analysis. The 2007 $1.2B estimate is based on more recent data, more realistic assumptions, and better estimating techniques using specific and consistent guidelines. NASA is currently generating updated data as we build this year's budget, which will be developed with the benefit of trade studies and "what-if" exercises conducted since last year's budget was built.

Every time NASA has projected outyear T&R costs, the numbers have decreased. At this time, the Agency does not want to commit to a firm set of outyear numbers, since data and trends indicate that transition and retirement costs will be *lower* than the most recent full estimate from 2007. A lean target cost for FY 2011-2015 has been established for this year's budget process to clearly communicate the desire to minimize this expense, as estimates are updated this year. The actual plan will be set after reviewing updated costs for each task, determining which tasks are mandatory, calculating the cost/benefit ratio of discretionary tasks, and verifying that each task implementation method is reasonable, efficient and provides the lowest cost option to the Agency.

QUESTION 260:

How much has been spent on transition efforts to date?

ANSWER:

Through FY 2007, the Space Shuttle Program has spent approximately $26M for Transition and Retirement costs. An additional $60M is planned for FY 2008.

QUESTION 261:

What is NASA's current estimate of the total cost of transition and retirement of the Space Shuttle?

ANSWER:

Per the response to Question #259, above, the Agency is continuing to develop budget projections for the outyear costs of Transition and Retirement (T&R) activities; the results of this work will be reflected in future President's Budget Requests and in updates to the recently released *Workforce Transition Strategy – Initial Report (March 2008)*, which are due to Congress every six months.

QUESTION 262:

In what year are transition and retirement activities expected to be complete?

ANSWER:

Current plans call for Shuttle transition and retirement real and personal property disposition activities (the long-term item in transition and retirement) to be effectively complete (with no further significant budget impacts to ongoing programs) by about the middle of the next decade. It is important to note that NASA continues to disposition Apollo-era property at a low level even today, 32 years after the last flight of an Apollo vehicle.

QUESTION 263:

How much of the total estimated transition and retirement costs will be borne directly by the Shuttle program?

ANSWER:

The FY 2006-2010 Transition and Retirement (T&R) costs are entirely borne by the Space Shuttle Program, and are part of the program's budget line in the FY 2009 President's Budget Request. The disposition of outyear (i.e. FY 2011-2015) T&R costs will be determined as the cost projections themselves are developed during the formulation of the FY 2010 and future President's Budget Requests.

QUESTION 264:

How much of the total estimated transition and retirement costs will be borne by the individual centers and other NASA organizations?

ANSWER:

The impacts of Transition and Retirement (T&R) upon NASA's Field Centers and other organizations will be developed along with future President's Budget Requests, and reflected in those requests. In addition, NASA will provide updates to its recently released *Workforce Transition Strategy – Initial Report (March 2008)* to the Congress every six months. These updates will display the latest data available on the impacts of NASA's T&R efforts on work and workforce at the Centers.

QUESTION 265:

Where will transition and retirement funds outside the Shuttle program request be in NASA's budget request and will these funds be clearly identified?

ANSWER:

The disposition of Transition and Retirement (T&R) outyear funding will be determined as part of the formulation of FY 2010 and future President's Budget Requests. These funds will be broken out and identified in Program Reviews with Congressional staff after the rollout of each request.

QUESTION 266:

What progress has NASA made in establishing a centralized database to manage and track transition and retirement activities?

ANSWER:

NASA maintains a number of data tools to track real and personal property and vendor activities in the Shuttle program to manage transition and retirement safely, effectively, and efficiently, including the following:

- Vendor Suppliers and Capabilities. NASA actively tracks the total pool of qualified and active suppliers to the Space Shuttle program to ensure a continued production and engineering support capability for critical mission hardware and services. As of September 2007, there were approximately 1,186 active suppliers and 3,000 – 4,000 qualified suppliers.

- Strategic Capabilities Asset Database (SCADB). The SCADB tracks approximately 292 strategic capabilities in the Space Shuttle program. A capability is a collection of vendors, production and test facilities, workforce skills, and supporting institutions that together support the manufacture of new Shuttle hardware. Capabilities tracked in the SCADB include Space Shuttle Main Engine nozzles, case segments for Solid Rocket Motors, and reinforced carbon-carbon for the Orbiter wing leading edges and nose cap. Key Decision Dates (KDDs) for each capability in the SCADB allow Shuttle program managers and Agency leadership to see when major capabilities are no longer needed by the Shuttle program, while a rigorous decision-making mechanism from the project element through the Agency level provides insight as to when those capabilities are available for use by other NASA programs or are eligible for disposition.

- Workforce. The most important element in the success of NASA's mission is the Agency's highly-skilled and highly-experienced space flight workforce. In order to ensure that critical skills remain through the life of the Shuttle program and that the transition to Constellation development and operations is smooth and successful, NASA tracks a number of workforce performance metrics, including workforce sharing between the programs at both the civil servant and contractor level, employee satisfaction, and attrition rates across program elements and geographical locations. More information on this topic can be found in *NASA's Transition Workforce Strategy*, released to the Congress on March 31, 2008.

QUESTION 267:

What metrics is NASA using to measure transition progress? How is the Space Shuttle program progressing against these metrics?

ANSWER:

NASA is using a variety of metrics to track transition progress. Some of these include measures related to facilities transition from Shuttle to Constellation, workforce synergy metrics, and communications initiatives.

QUESTION 268:

When will NASA provide to the Committee its report on transitioning the shuttle workforce?

ANSWER:

NASA's *Workforce Transition Strategy – Initial Report* was delivered to the Committee on March 31, 2008.

QUESTION 269:

How is NASA working the current space shuttle contractors to minimize the effect on the contractor workforce? If any, what are the limitations?

ANSWER:

NASA is utilizing a variety of tools to minimize the impact of Transition and Retirement (T&R) activities on the Space Shuttle contractor workforce. The Agency is assisting in the development and implementation of contract workforce retention plans for key workforce at each Space Shuttle prime contractor, with a focus on communication and future work. In some cases, prime contractors are implementing monetary retention incentives. As appropriate, the contractor community is using a range of tools, such as cross-training, to demonstrate a future path for employees, as well as embedding personnel with operational experience in the design phases of Constellation's vehicles.

One of the limitations when addressing concerns about contractor workforce levels is that NASA procures services, not workforce levels, from its contractors; thus, the Agency does not have direct control over the number of contractor employees engaged in its programs and projects.

Additional initiatives will continue to be worked as part of the current budget development process, and NASA will provide updates to the status of these items in future updates to the *Workforce Transition Strategy*.

QUESTION 270:

Are there plans to fly Atlantis after the Hubble mission? If so, when? If a decision has not been to Atlantis flight status, when will the decision be made?

ANSWER:

NASA is reviewing the option of flying the Shuttle *Atlantis* after this year's Hubble Space Telescope Servicing Mission-4 (HST-SM4), but no final decision has been made. The Agency is considering options that would allow the continued operation of the Orbiter within the existing Space Shuttle Program budget, as keeping *Atlantis* flying would add manifest robustness. A decision is expected in Summer 2008.

QUESTION 271:

NASA seems to be continuing to have troubles estimating the costs of its major projects. What are the steps that the agency is taking to address this issue?

ANSWER:

NASA has already taken multiple steps to obtain more realistic cost and schedule estimates, and to assure that these are, where possible, reflected in the baselines that the Agency provides to the Congress. To obtain more realistic cost estimates, NASA is setting up better estimation processes, increasing training of cost estimation personnel and program/project managers on cost risk analysis and performing "root cause" analyses to better understand the contributing factors for cost and schedule growth.

Specifically, NASA has included a requirement in NPR 7120.5D for major space flight projects to have Independent Cost Estimates at the starts of Phases B (*Preliminary Design & Technology Completion*) and C (*Final Design and Fabrication*). Cost risk analysis workshops were developed and then delivered at Jet Propulsion Laboratory, Goddard Space Flight Center, Glenn Research Center, and Kennedy Space Center, with plans to hold workshops at the Johnson Space Center and Marshall Space Flight Center by summer 2008. In addition, several workshops were conducted in October and November 2007 across the NASA spaceflight Centers that focused on the "claimed root causes" for cost and schedule growth. The workshops were attended by representatives of NASA's cost and program management communities, and industry representatives from Lockheed Martin and Orbital Sciences Corporation, among others. Synthesized findings from these workshops and previous studies, along with findings and recommendations to mitigate the root causes were presented to NASA Senior Leadership shortly after these workshops. Further definition and analysis on several of the findings will be presented later in 2008 for action on a final set of recommendations.

NASA has developed a process to collect the programmatic, technical and cost experiences of projects completed since 1996 as well as on-going projects. A data collection document, called the Cost Analysis Data Requirement (CADRe), is used to document these experiences as they and the cost/schedule trend across time and provide a common basis of comparison between projects to improve parametric estimation in the future. The Cost Analysis Division of the Office of Program Analysis & Evaluation has completed 60 CADRes as of March 31, 2008. NASA is building an automated database to make this data available to the cost and resource community in developing estimates for future projects. This will allow NASA's cost estimates to better reflect the experiences of past projects. Estimates that incorporate historical experience are typically more realistic than estimates that are based on a build up of component costs. NASA is also undertaking several cost research projects to improve the state of cost estimating methods and tools, to address estimating process weaknesses.

To assure that realistic baselines are set with the Congress and are reflected in the annual budget request, a policy was established by the Administrator, to budget projects with a 70 percent probability of being successful for the requested resources. This policy will be applied where feasible within NASA's budget topline. This policy has been drafted for inclusion in NASA Policy Directive 7120.4: Program and Project Management, to promulgate the policy.

During the remainder of FY 2008, NASA plans to take additional actions to continue to improve cost estimation processes: "Basis of Estimate" reviews will be conducted on all new projects (those about to enter Phase A) as part of the FY 2010 budget submission process to improve initial cost estimates. These reviews will permit the agency to ensure that initial resources are in line with the project's scope. Cost risk management requirements will be included in NASA Procedural Requirement 8000.4A (Risk Management) with guidelines identified in the NASA Cost Estimating Handbook. These requirements and guidelines integrate cost estimating, cost-risk identification, cost data procurement, cost reporting and cost data collection for estimating improvement. The Agency will continue to develop CADRes, track changes in project cost estimates and assess the root causes for those changes, and provide recommendations to senior management regarding additional means of improving cost estimation and reducing root causes of cost growth.

QUESTION 272:

NASA has removed the indirect costs from its project budgets for FY2009 and is accounting for this information in a separate appropriations account. Can NASA still quantify the dollar amount of indirect costs associated with each of its projects?

ANSWER:

We have provided to Committee staff a pro forma view of the budget with the Cross-Agency Support and Inspector General costs allocated to each of the Agency's Themes. This is a full-cost equivalent view of the budget.

QUESTION 273:

Currently NASA only provides a lifecycle cost estimate to the Congress for its projects upon entering development. Given the importance of this early stage, what benchmarks can NASA provide the Congress to enable us to monitor projects and provide some accountability for cost growth during the entire project life-cycle?

ANSWER:

The structure and content of NASA's annual Congressional Budget Justification is designed to provide accountability by including the data needed to monitor projects for cost growth across the project life cycle. NASA's annual budget request, encapsulated in the Integrated Budget and Performance Document (IBPD), has been designed by NASA's performance management personnel and NASA budget formulation staff to ensure that program performance data is provided to the Congress for decision-making and accountability. For the purpose of benchmarking and monitoring, NASA's IBPD provides comparisons of current and projected cost information against project formulation or development baselines. This information is provided annually, for each program and project that NASA reports on. Each program or project also includes key parameters beyond the estimated costs, such as the science and exploration goals they support, trends on annual performance goals, estimated schedule milestones, project hardware/software deliverables, acquisition strategies and discussion of major risks to the deliverables, cost and schedule. The reason for any change to these parameters is presented in tabular form and discussed in narrative.

NASA currently provides to the Congress a budgeted life cycle cost estimate for projects that have entered development, broken down into the costs for formulation, development and operations with actual or enacted amounts for years prior to the budget year, and estimated amounts for years beyond the budget year. NASA commits to a life cycle cost when the project reaches confirmation and is approved to start development. In a similar manner, NASA provides a full five-year estimated budget and key estimated schedule for projects in formulation. The fidelity of cost and schedule information is subject to change as design risks are better understood and mitigated, technology is matured and the specific design solution is selected. Investments in the project prior to development are used to mitigate technology risks, develop the design solution that meets NASA's mission goals, and explore the trade space of cost and schedule versus project deliverables. To aid the Congress in tracking how the project is progressing through formulation, estimated schedule life cycle milestones are shown as of the budget year and budget year minus one versus the expected milestones per the Formulation Authorization Document. This document signifies that a project has defined its programmatic and cost plans to a level that meets NASA's engineering process criteria, and NASA can then decide to authorize the Mission Directorate to invest money in that mission.

Tables of the year-to-year changes, including five-year projections, for both projects in formulation and development, can be compared with prior IBPDs for the traceability of shifts in project approach, which are factors that lead to cost and schedule change, and NASA's response to these changes. This detail is required of all projects with an estimated life cycle cost greater than $75.0M.

Further, the Management and Performance Section of the budget justifications provides summary information on past and current project performance, discusses what factors have led to under-performance and provides performance improvement plans. The Annual Performance Plan, as required by the Government Performance and Results Act of 1993, includes many other relevant commitments for how NASA conducts business in support of it programs and project. The Annual Performance Report, also included in this section, shows how NASA performed toward its key programmatic commitments across four years in a budget theme. This latter information, trended through time provides a good indicator of how a program or project may be doing. NASA holds the policy of having an annual performance goal in most years for the projects that have an estimated life cycle cost above $250 million.

For the FY 2010 budget request, NASA is planning updates to the IBPD within the specific project pages to include more information on major contracts, contract cost growth and critical technology development, the latter similar (not identical) to what was provided in the FY 2005 budget request. Critical technology development is a good parameter to assess the progress of a project in formulation. Contract traceability, is important for both projects in formulation and development. Critical technology and contractor performance provide indicators as to what factors lead to cost and schedule growth, and where NASA management attention is required. In future years, within the Management and Performance Section of the IBPD, NASA plans to show key performance trends across multiple projects and to increase discussion on the management steps to improve performance.

QUESTION 274:

Numerous times, NASA's budget notes that problems with contractor performance have led to cost overruns and schedule delays (examples: SOFIA w/ USRA, Kepler w/ Ball, Glory w/ Raytheon, OCO w/ Hamilton Sundstrand). What management efforts is NASA undertaking to ensure better contractor performance given repeated problems with contractors on major projects?

ANSWER:

NASA has instituted a multi-pronged approach to strengthen acquisition planning and execution, increase management oversight, and assess and address root causes for problems with contractor performance. NASA has re-visited forums and metrics used to monitor, track and report contract performance. NASA will also be taking a closer look at how contractor performance contributes to program and project performance success.

As outlined in NASA Procedural Requirements 7120.5D: "NASA Space Flight Program and Project Management Requirements," the Agency has instituted a strategic acquisition planning and authorization process designed to strengthen program and project formulation. This process begins with and Acquisition Strategy Planning (ASP) Meeting which approves a new or substantially changed program or project triggered by Agency requirements or legislative direction. The ASP is followed by an Acquisition Strategy Meeting (ASM) to ensure program planning is in place and validates make/buy rationale and any partnership decisions. The process culminates in a Procurement Strategy Meeting (PSM) to approve the procurement strategy for individual procurements. PSMs are conducted in accordance with Federal Acquisition Regulations for each contract within a Project and focus on the procurement process. These events are part of the normal program and project formulation and implementation activities and lay a stronger foundation from which contracts will be managed.

In response to the GAO High Risk Series that placed the Agency on the list for Contract Management, NASA developed a Corrective Action Plan (CAP). NASA's CAP seeks to improve the effectiveness of its program/project management across the board, including monitoring and analyzing contractor performance; life-cycle cost/schedule management practices; cost estimating practices; and associated business processes. As a part of the CAP, an initiative is underway to reengineer NASA's contractor cost reporting performance monitoring process to ensure that needed data elements are available for effective contract management, performance monitoring and Agency financial management, once a contract is awarded.

Further, the Agency has instituted a forum to monitor the Agency's largest and most complex contracts at a Senior Management review of program and project performance. On a monthly basis, all large contracts and task orders from NASA's major projects are tracked for current value compared to original value, award fee status, current and upcoming significant procurement actions (including undefinitized contract actions, restructures, etc,). Planned procurements that are within a six-month horizon are also highlighted and discussed. Each NASA Mission Directorate program and project is reviewed quarterly and their associated contracts are addressed in more detail. This forum and the data reviewed allow the Agency to focus on contract management and proactively address issues which may lead to project cost and schedule growth

Enhanced Use Leasing

QUESTION 275:

What progress has been made to develop an agency-wide Enhanced Use Leasing policy that is based upon sound business practices and lessons learned from the demonstration centers? When will the interim enhanced use leasing policy be replaced by a permanent agency-wide policy that will cover all NASA centers? If so, when does NASA expect this policy to be developed and implemented?

ANSWER:

An interim policy for enhanced use leasing was developed and issued in July 2007. Initial financial policy was issued in September 2007. Both policies are currently being finalized to include the expanded authority for all Centers under the new authority. It is expected that the new policy will be issued before the end of the FY 2008.

QUESTION 276:

Has NASA finalized its interim policy for enhanced use leasing agreements that affected only the two demonstration centers--Ames Research Center and Kennedy Space Center?

ANSWER:

An interim policy for enhanced use leasing was developed and issued in July 2007. Initial financial policy was issued in September 2007. Both policies are currently being finalized to include the expanded authority for all Centers under the new authority. It is expected that the new policy will be issued before the end of the FY 2008.

QUESTION 277:

How much revenue (both cash and in-kind) generated by NASA's Enhanced Use Leasing Program?

ANSWER:

The total revenue and value received including in-kind consideration in FY 2007 was approximately $6.8M.

QUESTION 278:

How much in cash proceeds does NASA anticipate that it will realize from enhanced use leasing in each of the first three years under the agency's new authority that includes all NASA centers and what plans does NASA have for using these anticipated funds?

ANSWER:

NASA Headquarters has begun working with Centers that have gained enhanced use lease authority to assist in developing enhanced use leases for their underutilized real property. The use of the authority over the next three years will depend on the complexity of proposed leases and whether negotiations can be completed. The revenue receipts that can be forecast for those years are only for those leases that we have already entered into. The revenue received in FY 2007 was approximately $6.8M. We anticipate improving on that amount with new leases. NASA will use these funds to cover the costs to NASA as well as for capital projects in support of the agency's facilities and infrastructure.

QUESTION 279:

What is the status of major projects planned at the demonstration centers using EUL funds, such as Ames' research park and Kennedy's space park?

ANSWER:

These major projects are in various stages of development. Due to their complex nature and, as NASA has sought appropriate tenants, the projects have been modified in scope from their original concepts when NASA first received enhanced use leasing authority.

QUESTION 280:

What mechanisms have been adopted to keep Congress fully informed of NASA's activities under the Enhanced Use Leasing Authority?

ANSWER:

NASA will continue to provide a fiscal year report to Congress on the progress of its use of enhanced use lease authority.

QUESTION 281:

How far along are NASA's plans to create a new launch site at the Kennedy Space Center using enhanced use leasing? How much revenue will this project generate?

ANSWER:

This project is still in the development stages, as NASA seeks to develop and negotiate a lease with an appropriate tenant. Until the lease is finalized, projections of revenue cannot be made.

QUESTION 282:

How far along are NASA's plans to create a new launch site at the Kennedy Space Center using enhanced use leasing? How much revenue will this project generate?

ANSWER:

This project is still in the development stages, as NASA seeks to develop and negotiate a lease with an appropriate tenant. Until the lease is finalized, projections of revenue cannot be made.

QUESTION 283:

What is the status of NASA's development of financial guidance including accounting controls and processes to ensure accountability over enhanced use leasing funds? Will there be an accounting system for tracking the value of in-kind consideration?"

ANSWER:

An interim policy for enhanced use leasing was developed and issued in July 2007. Initial financial policy was issued in September 2007. Both policies are currently being finalized to include the expanded authority for all Centers under the new authority. It is expected that the new policy will be issued before the end of the FY 2008. We believe the policy and procedural guidance provides the framework for sufficient accounting controls and processes to ensure accountability of EUL funds, which are broken out on a separate line in the apportionment process. Also, NASA in-kind consideration is now tracked in the accounting system through the use of memorandum accounts.

QUESTION 284:

On what basis does NASA plan to allocate enhanced use leasing funds among the centers?

ANSWER:

The NASA Centers will submit their plans for use of EUL revenue to Headquarters, which will review the requirements and make allocations as needed. Centers that have entered into enhance use leases and have generated revenue will be given priority consideration during the review.

FULL-TIME EQUIVALENTS

QUESTION 285:

In recent years, Congress has prohibited NASA from implementing any reductions in force (RIFs) or other involuntary separations (except for cause). How many full-time equivalent (FTE) employees does NASA have?

ANSWER:

For FY 2008 to date NASA has averaged approximately 18,100 FTE.

QUESTION 286:

How many do you expect to have in 2010, when the shuttle program ends? In 2015, when Orion makes its first flight with a crew? In 2020, when Orion takes astronauts back to the Moon?

ANSWER:

NASA currently plans on maintaining a civil service FTE level of approximately 17,900 FTE throughout the planning horizon based on anticipated requirements.

QUESTION 287:

What is NASA doing to adjust its workforce—in both size and mix of skills—as the agency's needs evolve between now and 2020?

ANSWER:

Based on mission requirements, both near- and long-term, NASA is continually identifying and matching needed skills to program tasks through a robust, comprehensive workforce planning process, which guides adjustments to the workforce. The overall goal is to obtain the right breadth and depth of skills appropriate to mission needs in a manner consistent with the principles of supporting ten healthy Centers, maximizing the use of the current workforce, and evolving to a more flexible and scalable civil service workforce.

Efforts to adjust NASA's workforce over the long term will continue to take a variety of forms including:

- encouraging voluntary attrition of employees with surplus skills through buyouts and voluntary early retirement;
- using retention incentives, as appropriate, to retain skills for which NASA has a continuing need;
- providing training and development opportunities, including leadership development, to mitigate skill mismatches;
- continuing to strengthen NASA's reputation as a "a good place to work" to attract new talent as well as retain employees with needed skills;
- facilitating the voluntary reassignment of employees available for new work to positions in which their skills are needed, using incentives as appropriate;
- realigning and redistributing work across the Agency to Centers with employees available for new work;
- instituting controls on external hiring and establishing ceilings on Center complements, when needed, to provide more placement opportunities for employees available for new work;
- filling the positions on a term, rather than permanent, basis to avoid involuntary reductions of permanent employees when programs end (e.g., Shuttle) and to maximize placement opportunities for employees available for new work;
- conducting targeted recruitment of individuals with needed skills, using programs such as the Student Employment Program, the Federal Career Intern Program, and the Presidential Management Fellows Program;
- using available recruitment incentives, as appropriate, to hire new talent with the necessary skills;

- continuing to strengthen partnerships/relationships with educational institutions which will be beneficial in future recruitment efforts;
- reemploying retired employees with critical skills for finite periods;
- continuing to offer employees "quality of worklife" options, such as flexible work schedules and telework; and,
- pursuing additional flexibilities, as appropriate, to further enhance NASA's efforts to have the right people with the right skills in the right place at the right time.

It is NASA's practice to manage attrition in a way that does not demoralize the workforce, create an environment of uncertainty or mistrust, stimulate the departure of the workforce the Agency needs to retain, or damage NASA's outstanding image as a leading employer of choice, which would result in a long-term negative impact on the Agency's ability to attract and retain the workforce it needs.

COTS

QUESTION 288:

For each Space Act agreement (both in place and canceled) please provide by milestone, the date that milestone is to be completed; the amount to be provided when the milestone is completed; and the amount that has been paid to date. In addition, provide by fiscal year the amount paid to date for each Space Act Agreement, the amount outstanding by fiscal year (assuming all milestones are met on time); and a total paid across the COTS program to date, and projected.

ANSWER:

Space X Milestones

	Previous Date	**Current Date**	**Current Amount**
1. Program Plan Review (complete)	Sept 06	NC	$23,133,333
2. Demo 1 System Requirements Review (complete)	Nov 06	NC	$5M
3. Demo 1 PDR (complete)	Feb 07	NC	$18,133,333
4. Financing Round 1 (complete)	Mar 07	NC	$10M
5. Demo 2 System Requirements Review (complete)	Mar 07	NC	$31,133,333
6. Demo 1 System CDR (complete)	Aug 07	NC	$8,133,333
7. Demo 3 System Requirements Review (complete)Oct 07		NC	$22,333,333
8. Demo 2 PDR (complete)	Dec 07	NC	$21,133,333
9. Draco Initial Hot-Fire (complete)	--	Mar 08	$6M
10. Financing Round 2 (complete)	Mar 08	NC	$10M
11. Demo 3 PDR	Apr 08	Jun 08	$22M
12. Multi-engine test (9 engines)	--	Sept 08	$22M
13. Demo 2/3 CDR	Jun 08/ Jan 09*	Dec 08	$25M
14. Financing Round 3	Mar 09	Mar 09	$10M
15. Demo 1 Readiness Review	Feb 08	Mar 09	$5M
16. Uhf Communications Unit Flight Unit Delivery	--	May 09	$9M
17. Demo 1 Mission	Sept 08	June 09	$5M
18. Demo 2 Readiness Review	Dec 08	Sept 09	$5M
19. Demo 2 Mission	Jun 09	Nov 09	$5M
20. Cargo Integration Demonstration	--	Jan 10	$5M
21. Demo 3 Readiness Review	Jul 09	Jan 10	$5M
22. Demo 3 Mission	Sept 09	Mar 10	$5M

NOTE: Underlined text indicates new Hardware Milestones (Milestones 9, 12, 16, 20)

* Demo 2 CDR (originally Jun 08) and Demo 3 CDR (originally Jan 09) were combined into one milestone with a planned date of Dec 08.

Orbital Milestones

	Date	**Amount**
1. Program Plan Review (complete)	Mar 08	$10M
2. Demo Mission System Requirements Review	June 08	$20M
3. Unpress Cargo Module Preliminary Design Review	Jul 08	$10M
4. Demo Mission PDR	Sept 08	$10M
5. Integ/Ops Facility at Wallops Started	Oct 08	$10M
6. Press Cargo Module PDR	Nov 08	$20M
7. Unpress Cargo Module CDR	Nov 08	$10M
8. Complete Development of Instrumentation Program and Command List	Feb 09	$10M
9. Demo Mission CDR	Mar 09	$20M
10. Visiting Vehicle Avionics Test	Jun 09	$15M
11. Unpress Cargo Module Fabrication Start	Jul 09	$5M
12. Service Module Core Assembly Start	Oct 09	$7.5M
13. Service Module Test Readiness Review	Jan 10	$7.5M
14. Service Module Comprehensive Performance Test	May 10	$5M
15. Launch Vehicle Stage 1 Assembly Complete	Sept 10	$5M
16. Mission Readiness Review	Oct 10	$2.5M
17. Demo Flight to ISS	Dec 10	$2.5M

RpK Milestones in the terminated SAA	**Date**	**Amount**
1. Program Implementation Plan (complete)	Sept 06	$7.3M
2. Financing Round 1 (complete)	Nov 06	$7.3M
3. System Requirements Review (complete)	Feb 07	$17.5M
4. Financing Round 2	May 07	$7.5M
5. Pressurized Cargo Module CDR	Aug 07	$5M
6. Unpressurized Cargo Module CDR	Sept 07	$5M
7. ISS Test Readiness Review (TRR)	Oct 07	$2.1M
8. Rendezvous Software TRR	Feb 08	$20M
9. Engine Test Firing	Feb 08	$20M
10. Pressurized Cargo Module TRR	May 08	$30M
11. K-1 Complete & shipped to Woomera	July 08	$20M
12 Certification of Flight Readiness	Sept 08	$4.5M
13. Pre-Demo 1 Risk Reduction Flight	Nov 08	$25M
14. First Demo Flight	Jan 09	$25M
15. Second Demo Flight	Mar 09	$10.6M

Current Space Act Agreements by Fiscal Year:

FY	Previous SpaceX ($M)	Current SpaceX ($M)	Orbital ($M)
2006	23.1	23.1	
2007	72.4	72.4	
2008	108.2	103.5	50
2009	74.3	59	90
2010	0	20	25
2011			5
Total ($M)	278	278	170

Total Obligations to-date by Fiscal Year:
(Note: This is SAA obligations only; excludes Program Management obligations.)

FY	SpaceX ($M)	RpK ($M)	Orbital ($M)	Total ($M)
2006	28.9	33.2		62.1
2007	96.1	-1.1		95.0
2008	78.7		50.0	128.7
Total ($M)	203.7	32.1	50.0	285.8

Expected remaining obligations by Fiscal Year:
(Note: This is SAA obligations only; excludes Program Management obligations.)

FY	SpaceX ($M)	Orbital ($M)
2008		
2009	74.3	94.5
2010		25.5
2011		
Total ($M)	74.3	120.0

Written questions submitted by Rep. Ruppersberger resulting from the March 5-6, 2008, hearing before the House Subcommittee on Commerce, Justice, Science and Related Agencies regarding NASA's FY 2009 Budget Request.

QUESTION 1:

According to the Academies Decadal Survey, the ICESat-II mission was recommended to be launched during 2010 – 2013. The Administration's budget assumes that this mission will be launched in 2015. When was NASA's initial estimate for launch of the ICESat-II Mission? Why is NASA pushing this mission back?

ANSWER:

The President's FY 2009 budget request, which was released on February 4, 2008, included the first assignment of funding for the Decadal Survey-recommended missions. The President's FY 2009 budget request provided sufficient funds – as one component of the line of "Decadal Survey Missions" – to begin formulation of ICESat-II, with a target launch date in FY 2015.

NASA has not pushed back the launch date of ICESat-II. NASA has established an executable implementation plan that accomplishes the necessary ICESat-II mission and implementation development within the allocated resources.

The Decadal Survey, released in January 2007, recommended an ICESat-II mission at a cost of about $300.0M. Throughout 2007, NASA conducted concept studies of all proposed Decadal Survey missions, including ICESat-II. These studies were intended to demonstrate the feasibility of, and challenges associated with, the mission concepts, and did not define baseline missions. One of the findings of the ICESat-II concept study was that a simple re-flight of the ICESat-I mission design would cost as much as 90 percent more than the amount estimated by the Decadal Survey.

A launch date of 2015 was determined by NASA based on many considerations, including but not limited to: (1) technical issues uncovered during the current on-orbit ICESat-I mission, e.g., laser limitations and the need to define and develop a reliable laser system; (2) necessity to define a clear and comprehensive trajectory of requirements from the mission science objectives to the measurement and mission requirements, including such issues as lifetime and reliability; (3) a detailed mission implementation budget profile leading to high confidence in the cost and schedule; (4) development of appropriate risk reduction activities with appropriate redundancies; and, (5) the current maturity level of the mission definition and required measurement technologies. NASA has embarked on an expedited activity to select a Science Definition Team (SDT) through competitive proposals solicited through an Amendment to the 2008 NASA Research Opportunities in Space and Earth Sciences (ROSES). NASA, working with the SDT and others during the current pre-Phase A formulation stage, will define the optimal mission configuration compatible with allocated resources. This extended team will investigate partnerships with non-NASA organizations, study instrument and mission designs, and examine science requirements to identify significant cost and performance parameters.

QUESTION 2:

As you know, I'm also on the House Intelligence Committee, where I'm the Chairman of the Technical and Tactical Subcommittee. I have held a series of round-table discussions with the major prime contractors associated with our space industry. I have discovered that a large portion of our nation's critical R&D investment has been directed into program developments. In other words, rather than performing needed research ahead of time, operational programs are expected to develop new technologies during the development cycle. This has had a negative impact on our space industry. I would like to know if you have seen any similar trends within NASA's R&D efforts?

ANSWER:

While funding for long-range, low-technology readiness level (TRL) development has declined in recent years, NASA's technology programs have become more tightly focused on delivering critical technologies for its future missions. NASA has been able to maintain an adequate level of basic Research and Development within its present level of funding. NASA's research and technology development programs have the funds necessary to support the missions that the President has asked us to do. NASA research and technology activities primarily exist in the Exploration Systems Mission Directorate (ESMD) and the Science Mission Directorate (SMD).

In the past, NASA invested in a broad range of low-maturity, crosscutting technologies that were not directly tied to a specific mission need with the objective that a few innovative concepts would eventually find their way into future missions. For ESMD, this approach would not be effective as the technology investments are needed to support the Constellation program's cost and schedule constraints. A focused technology development process ensures that mature technologies meeting specific performance requirements are delivered on time to be inserted into the design of flight systems. In 2005, NASA established the Exploration Technology Development Program (ETDP) to provide mission-enabling technologies to the Constellation Program, which is designing the flight systems for lunar exploration. The ETDP is working on the highest priority technologies for lunar exploration, including heat shield materials for the Orion crew exploration vehicle, composite structures for the Ares launch vehicles, rocket engines for the lunar lander, and life support systems for Orion and the lunar outpost. Technology is matured in the ETDP to the point where it is ready to be incorporated into preliminary system designs, and then it is transitioned to the Constellation Program where it is qualified for flight and integrated into operational systems. This approach follows the recommendations of the Government Accountability Office.

An analogous situation exists in SMD, where we need to target our technology investments to enable the highest priority future missions recommended by the science community in National Research Council decadal surveys. Several niche efforts are definitely required where technologies are required for multiple missions; space-based nuclear power and propulsion and Earth science sensor technology are good examples. We also employ tailored precursor technology development aimed specifically at a particular project, such as our extensive technology efforts during the formulation phase of the James Webb Telescope (JWST). Generally, we require that all necessary technologies for a given mission are advanced to Technology Readiness Level 6 [system/subsystem model or prototype demonstration in a relevant environment (ground or space)] before the project is confirmed to proceed to the development phase.

It is important to realize that "program developments" at NASA are unlike those at other Federal agencies to the extent that we are in the business of developing first-of-a-kind systems, often one of a kind in the case of SMD missions. NASA does things that no one in the Federal government (or in the world) has ever done before, on a routine basis. Once systems become routine or "operational," the technologies are passed to other Agencies to maintain, e.g. our relationship with NOAA regarding the production of geostationary weather satellites.

NASA is first and foremost an R&D organization. The vast majority of what we do, up to and including the operation of the Shuttle is of a research and development nature. To a large degree our budget and the activities it represents are the exact type of Research and Development activity referenced in the question.

QUESTION 3:

Several projects and their associated percentage cost change are listed in your budget justification documents in the Management and Performance Section. What is the reason for the cost increases for the 5 of the 10 programs that you do not describe in detail on page Man-9?

ANSWER:

The reasons for the cost increases in Herschel, Kepler and NPOESS Preparatory Program (NPP) were reported in NASA's FY 2008 Budget request, page MP-8, NASA Operating Plans, as well as in other written communications to NASA's Committee Chairmen. Briefly:

- Herschel is an ESA mission with three instruments. NASA's role was to deliver components to two of the three European principal investigators. All U.S. components have been delivered. For reasons unrelated to the U.S. components, ESA has delayed the launch of Herschel by six months. This results in increased U.S. development costs, as we must continue to support the principal investigators as the observatory is prepared for launch.

Kepler's cost and schedule growth were due to delays in the processing of primary optics, and inefficiencies at the prime contractor in development, especially in the specialized signal-conditioning circuits used with the detector. NASA has instituted major oversight and development flow changes on the project and at the prime contractor, including incentivizing contractor performance by including award fee as part of the project cost reserves. Kepler has performed within budget and schedule since July 2007, and is meeting its major milestones toward launching in February 2009.

- NPP is a joint NASA-DoD-NOAA project. Launch has been delayed by late instrument deliveries from our non-NASA partners, resulting in the cost growth noted.

More detailed Cost and Schedule Analysis reports for these missions, as required by the NASA Authorization Act of 2005, will be provided to the Congress shortly.

Two other SMD missions have cost growth identified on page Man-10: Mars Science Lab (7 percent) and the Solar Dynamics Observatory (3 percent). MSL is currently under review; cost growth in excess of 15 percent is highly likely, due to a variety of technical issues (most notably with the heat shield material) and underestimation of the complexity of the mission. SDO cost and schedule growth was driven in part by difficulties developing the 16 megapixel detectors (the largest detectors ever used for such a mission) and problems with high data rate transfers between the spacecraft and science instruments.

Written questions submitted by Rep. Frelinghuysen resulting from the March 5-6, 2008, hearing before the House Subcommittee on Commerce, Justice, Science and Related Agencies regarding NASA's FY 2009 Budget Request.

QUESTION 1:

In the past you identified the reduction of "uncovered capacity", or the number of employees not directly assigned to specific projects, as a significant management challenge. What is the current status and outlook for your "uncovered capacity"? Do you see uncovered capacity re-emerging as a significant issue in the outyears?

ANSWER 1:

NASA now refers to "uncovered capacity" as Available for New Work (AFNW). (This subset of Agency FTE is considered "available" because it has not yet been planned to identify program demand through the Planning, Programming, Budgeting, and Execution (PPBE) process. Reducing the number of AFNW FTE through PPBE is a manageable challenge for NASA.

- NASA has significantly improved the effectiveness of the PPBE process with regard to AFNW reduction. Workforce planning has been more effectively integrated with program budgeting. AFNW reduction is supported through a high level of collaboration between the Mission Directorates, the Centers and the Headquarters staff. The Agency has increased attention on planning workforce throughout all five years of the budget window, and this has increased identified demand through all years. This has enabled Centers to plan better for long-term skill needs and to narrow the skill mix issues to the areas of real concern. One measure of the success in this area is the reduction by almost 1600 FTE of AFNW for FY 2013.

- As a result of PPBE 09 planning, allocated demand in FY 2009 increased by about 1000 FTE and AFNW was reduced from over 800 FTE to about 200 FTE. At the same time, three Centers have demand beyond their ceiling, totaling 376 FTE in FY 2009, but the Agency currently does not have plans to shift this remaining excess demand to the Centers with available workforce. It is expected that increasingly well-understood program demand by the time of the execution year will resolve the remaining FY 2009 AFNW issue.

- NASA reduces its AFNW on an ongoing basis through strategies such as: buyout and early retirement incentives, hiring controls, expanded use of non-permanent workforce, a shared assets account, decisions to retain work in-house to protect and strengthen core capabilities, and the transfer of Exploration program work to Centers with AFNW capacity, principally the Ames Research Center, the Glenn Research Center, and the Langley Research Center.

- Reductions in force (RIFs) will not be required at any Center in the foreseeable future.

QUESTION 2:

Since 2003, NASA has not been able to produce auditable financial statements. Audit reports have identified significant deficiencies resulting from a lack of effective internal control procedures and from data integrity issues. What are your remaining material weaknesses and what is the plan for resolving those?

ANSWER:

NASA has two remaining material weaknesses: *Financial Systems, Analyses, and Oversight* (FSAO); and, *Enhancements Needed for Controls Over Property, Plant and Equipment (PP&E) and Materials.* The FSAO material weakness addresses multiple entity-wide internal control weaknesses, identified by the agency's independent auditor. To resolve these issues, NASA has developed a Comprehensive Compliance Strategy (CCS) that focuses on ensuring compliance with Generally Accepted Accounting Principles (GAAP) and other financial reporting requirements. The CCS also covers the standards and requirements necessary to cure deficiencies noted in recent audit and related reports. The CCS serves as the basis for implementing comprehensive proactive corrective actions and provides the guiding principles for executing effective financial management functions and activities with internal control and compliance solutions inherently embedded in the processes.

In the first quarter of FY 2008, NASA undertook an internal review and engaged a nationally-recognized accounting firm to perform an in-depth analysis of requirements for NASA to be in compliance with GAAP and other applicable financial standards, to demonstrate such compliance through auditable evidence, and to operate with robust and comprehensive internal controls. Validation of this framework and plans to implement the required actions to conform NASA policies to this framework were completed in the second quarter of FY 2008. An assessment of the remedial actions necessary is underway, and upon completion of the assessment, timing and phasing for resolution will be determined. The CCS provides the critical path milestones for NASA to resolve the FSAO material weakness.

The Property, Plant and Equipment material weakness is comprised of issues primarily related to the agency's reliance on contractors to "report property values at periodic intervals without robust agency-wide detect controls," and difficulties ensuring the completeness of balances for certain legacy assets.

In November 2007, NASA implemented a new policy and related procedures for identifying the cost of individual assets throughout the asset's acquisition lifecycle. This policy change was based on guidance received from the Federal Accounting Standards Advisory Board (FASAB). These changes support the verification and reconciliation of asset values for those assets developed through new contracts (post November 2007) and certain large pre-existing contracts. For legacy assets, like the Space station and Space Shuttles, NASA does not have the necessary supporting information available to provide auditable book values for the Space Shuttle and the International Space Station (ISS). Together, Shuttle and ISS related assets currently represent over $14B of the total $20.6B PP&E net asset value reported in the September 30, 2007 fiscal year-end financial statements. While certain of the existing Shuttle and ISS assets will be transitioned for use on other NASA programs, much of this issue may become moot with the passage of time, as the Shuttle is to be retired in 2010, and the ISS is being depreciated based upon a 15-year specification life through 2016. While the ISS depreciation schedule naturally leads to 2016 as an outside date for resolution of this issue, NASA is presently developing and evaluating a variety of alternatives with a view to achieving a timelier, albeit still cost efficient and effective, solution for this issue.

QUESTION 3:

I understand that you completed a gap analysis for your financial management and business systems. What requirements did you identify in this area, and what are the estimated costs? Are those systems improvements included in this budget request?

ANSWER 3:

NASA completed a gap identification and prioritization activity in October 2007, which resulted in a list of 12 relatively high-priority business system gaps. Subsequently, we have been conducting a series of workshops to: (1) perform causal analysis (to ensure we address the underlying cause and not the symptom); (2) develop corrective action plans; and, (3) develop user stories/needs statements for IT Concept Development. The user stories/needs statements provide the basis for the top level requirements. The next phase of this activity is to develop concepts and cost estimates for any IT modifications. Once IT concepts have been developed, another prioritization process will be required to support the decision making process for strategic investments. Therefore, these investments are not included in the current budget request. Corrective actions that do not require IT modifications are promoted for implementation following corrective action plan development.

Several corrective actions have been implemented and NASA is assessing whether or not we are ready to close 3 of the top 12 gaps.

QUESTION 4:

Another management issue that has been identified is Information Technology Security. Both GAO and your Inspector General have identified this as a material weakness. Recently GAO ranked agencies on whether they complied with five specific system security criteria, and found that NASA has not met two of the five. What are the two criteria you have not yet met, and to the extent that funds are needed to make the necessary improvements, are those funds included in your budget request for FY 2009?

ANSWER 4:

The two criteria that OCIO had not yet met were derived from OMB memorandum M-06-16 and M-07-16. Those requirements were:

1. Use a "time out" function for remote access and mobile devices requiring user re-authentication after 30 minutes of inactivity; and,

2. Log all computer-readable data extracts from databases holding sensitive information and verify that each extract including sensitive data has been erased within 90 days.

The extent that funds are needed to meet requirement number one is nil. Requirement number one has been completed. For requirement number two, OCIO is still working to identify a commercial solution that will resolve the requirement. Funding has not been explicitly identified because a viable commercial solution has not yet been identified.

QUESTION 5:

Your FY 2008 Appropriation included a rescission of prior year unobligated balances totaling $192.5M. Please submit a description of how you are applying that rescission, and describe for the Committee the programmatic impacts that result from this rescission? What unobligated balances are you expecting to have remaining at the end of FY 2008, and for what purposes?

ANSWER:

NASA rescinded prior-year balances across accounts in proportion to the remaining unobligated balances as of December 19, 2007. The rescission represented about 35 percent of unobligated balances at that time (excepting emergency hurricane funds and construction projects already in progress.) Rescission amounts by program are shown in Enclosure 5 of the initial FY 2008 Operating Plan (attached), and a narrative description of the affects of the rescission is provided in Enclosure 6 of the initial FY 2008 Operating Plan (attached).

FY 2007 Updated Operating Plan
February 2008
Enclosure 5

($ in millions)	FY 2007 Op Plan Update (May 2007)	Katrina Funding (P.L. 110-28) (Programmatic Changes)	FY 2007 Op Plan Update (June 2007)	Programmatic Changes	Programmatic (Direct) Rescissions	Institutional (Indirect) Rescissions	FY 2007 OP Update (Jan 2008 w/Rescission)
Total NASA	16,264.9	20.0	16,285.0		(168.4)	(16.8)	16,100.0
Science, Aeronautics, and Exploration	5,371.4		5,371.4		(148.9)	(13.4)	5,284.4
Science	5,371.4		5,371.4		(80.0)	(7.2)	5,284.4
Solar System Exploration	1,587.0		1,587.0		(15.2)	(1.4)	1,570.5
Discovery	149.0		149.0		(8.9)	(0.8)	139.3
New Frontiers	117.9		117.9		(0.3)		117.7
Technology	71.9		71.9		(0.6)	(0.1)	71.2
Deep Space Mission Systems (DSMS)	247.4		247.4				247.4
Solar System Research	301.2		301.2		(4.6)	(0.4)	296.2
Mars Exploration	699.6		699.6		(0.8)	(0.1)	698.7
The Universe	1,610.8		1,610.8		(8.2)	(0.7)	1,601.9
Navigator	69.5		69.5		(0.1)		69.4
James Webb Space Telescope	478.5		478.5				478.5
Hubble Space Telescope	337.4		337.4		(2.0)	(0.2)	335.2
Stratospheric Observatory for Infrared Astronomy (SOFIA)	47.0		47.0				47.0
Gamma-ray Large Space Telescope (GLAST) Program	107.3		107.3		(4.5)	(0.4)	102.3
Discovery	141.7		141.7				141.7
Explorer	74.6		74.6		(1.2)	(0.1)	73.3
Universe Research	312.7		312.7		(0.0)		312.7
International Space Science Collaboration	19.7		19.7		(0.3)		19.4
Beyond Einstein	22.5		22.5		(0.0)		22.5
Earth-Sun System	2,173.6		2,173.6		(56.6)	(5.1)	2,112.0
Earth Systematic Missions	303.0		303.0		(24.2)	(2.2)	276.6
Living with a Star	227.3		227.3	(0.2)			227.2
Solar Terrestrial Probes	87.0		87.0		(10.0)	(0.9)	76.1
Explorer Program	89.8		89.8				89.8
Earth System Science Pathfinder	190.4		190.4		(11.0)	(1.0)	178.4
Earth-Sun System Multi-Mission Operations	274.9		274.9				274.9
Earth-Sun Research	826.4		826.4	0.2	(0.5)		826.1
Applied Sciences	40.9		40.9		(9.5)	(0.9)	30.5
Education and Outreach	20.1		20.1		(0.9)	(0.1)	19.1
Earth-Sun Technology	113.7		113.7		(0.5)		113.2

FY 2007 Updated Operating Plan
February 2008
Enclosure 5

($ in millions)	FY 2007 Op Plan Update (May 2007)	Katrina Funding (P.L. 110-28) (Programmatic Changes)	FY 2007 Op Plan Update (June 2007)	Programmatic Changes	Programmatic (Direct) Rescissions	Institutional (Indirect) Rescissions	FY 2007 OP Update (Jan 2008 w/Rescission)
Exploration Systems	3,457.1		3,457.1		(39.9)	(3.6)	3,413.6
Constellation Systems	2,550.5		2,550.5		(22.3)	(2.0)	2,526.2
Exploration Systems Research & Technology	644.7		644.7		(17.6)	(1.6)	625.5
Exploration Technology Development	338.3		338.3		(5.7)	(0.5)	332.1
Robotic Lunar Exploration	298.1		298.1		(11.9)	(1.1)	285.1
Prometheus Nuclear Systems & Technology	8.3		8.3				8.3
Human Systems Research & Technology	262.0		262.0				262.0
Life Support & Habitation	82.4		82.4				82.4
Human Health & Performance	162.9		162.9				162.9
Human Systems Integration	16.6		16.6				16.6
Aeronautics Research	716.7		716.7		(7.3)	(0.7)	708.8
Aeronautics Technology	716.7		716.7		(7.3)	(0.7)	708.8
Aviation Safety Program	105.4		105.4		(0.8)	(0 1)	104.5
Airspace Systems	123.8		123.8		(1.6)	(0.1)	122.0
Fundamental Aeronautics	398.8		398.8		(4.9)	(0.4)	393.4
Aeronautics Test Program	88.7		88.7				88.7
Cross-Agency Support Programs	540.5		540.5		(21.8)	(2.0)	516.8
Education	139.7		139.7				139.7
Advanced Business Systems	86.3		86.3				86.3
Innovative Partnerships Program	228.2		228.1	(2.2)	(21.8)	(2.0)	202.2
Shared Capability Assets Program	86.3		86.3	2.2			88.5
Exploration Capabilities	6,147.0	20.0	6,167.1		(19.3)	(3.4)	6,144.4
Space Operations	6,147.0	20.0	6,167.1		(19.3)	(3.4)	6,144.4
Space Shuttle	3,977.4	20.0	3,997.4		(19.3)	(3.4)	3,974.7
Space Shuttle	3,977.4		3,977.4			(3.4)	3,974.0
Hurricane Recovery		20.0	20.0		(19.3)		0.7
International Space Station	1,773.0		1,773.0				1,773.0
Space and Flight Support (SFS)	396.6		396.6				396.6
Space Communications	230.2		230.2				230.2
Launch Services	100.6		100.6				100.6
Rocket Propulsion Testing	56.0		56.0				56.0
Crew Health & Safety	9.8		9.8				9.8
Inspector General	32.2		32.2		(0.2)		32.0

Institutional - CMO		(4.5)
Institutional - IINV		(3.0)
Institutional - Corporate		(9.4)
	Total FY07	(16.8)
Residual CoF and ECR funds available from FY06 and prior		(7.2)
Total Institutional Rescission		(24.1)

FY 2007 Operating Plan Update

SCIENCE MISSION DIRECTORATE

Solar System Exploration

Discovery

Enacted Appropriations Action (-$9.7M)

- **-$9.7M,** Rescind $8.9M plus $1M of indirect made available by the selection of only one new mission in December. No programmatic or out-year impacts.

Other Notifications

- **+$0.0M,** $11.8M in additional funding is provided to Dawn from Discovery Future due to the Dawn launch delay (from June to Sept 2007 launch) and additional telemetry requirements. The reduction to Discovery Future has no impact on the current AO selection schedule.

New Frontiers

Enacted Appropriations Action (-$0.3M)

- **-$0.3M,** Rescind funds from program management activities. No significant programmatic or out-year impacts.

Solar System Technology

Enacted Appropriations Action (-$0.7M)

- **-$0.7M,** Rescind $0.6M from In-Space Propulsion, and $0.1M in indirect funds. No significant programmatic or out-year impacts.

Solar System Research

Enacted Appropriations Action (-$5M)

- **-$5M,** Rescind $4.6M and $0.4M in indirect funds. $0.7M reserve not required for the JPL contract award fee and $3.8M from Education and Outreach and administrative funds. No significant programmatic or outyear impacts.

Mars Exploration Program

Enacted Appropriations Action (-$0.9M)

- **-$0.9M,** Rescind $0.8M plus $0.1M of indirect funds. $0.5M reserve not required for the JPL contract award fee and $0.3M, in Mars Reconnaissance Orbiter (MRO) funds. No significant programmatic or outyear impacts.

Other Notifications

- **+$0.0M,** $17.4M in additional funding is provided to MSL to provide additional funds to get through the start of FY08 and to begin work on the Mars Sample Return Box (MSRB), additional scope added to mission). Funding was provided from Phoenix (-$10M), Mars program reserve, and other Mars activities (-$7.4M). There is no programmatic impact and no change in the life cycle cost or launch date of Phoenix. The life cycle cost of MSL increases by $1.1M for the MSRB. Refer to the initial FY08 Operating Plan for net life cycle cost change for MSL

The Universe

Navigator

Enacted Appropriations Action (-$0.1M)

- **-$0.1M,** Rescind reserve not required for the JPL contract award fee.

Hubble Space Telescope

Enacted Appropriations Action (-$2.2M)

- **-$2.2M,** Rescind $2M in HST Development funds and $0.2M in indirect funds. No significant programmatic or outyear impacts. Requirements for SM4 and other HST activities are fully supported with planned FY 08/09 funding.

Gamma-ray Large Area Space Telescope (GLAST)

Enacted Appropriations Action (-$4.9 M)

- **-$4.9M,** Rescind $4.5M plus $0.4M in indirect funds. Direct funds are restored in FY08, with no change to lifecycle costs and no programmatic impact to GLAST.

Astrophysics Explorer

Enacted Appropriations Action (-$1.3M)

- **-$1.3M,** Rescind $1.2M of Wide-field Infrared Survey Explorer (WISE) mission management funds and $0.1M in indirect funds. No significant programmatic or out-year impacts.

International Space Science Collaboration

Enacted Appropriations Action (-$0.3M)

- **-$0.3M,** Rescind reserve not required for the JPL contract award fee.

Earth-Sun System

Earth Systematic Missions

Enacted Appropriations Action (-$26.4M)

- **-$26.4M,** Rescind $11.9M of Landsat Data Continuity Mission (LDCM) funds, $11.6M, of NPOESS Preparatory Project (NPP) funds, $0.5M of Glory mission funds, $0.2M of Ocean Surface Topography Mission (OSTM) funds and $2.2M in indirect funds. All direct funds will be restored in future years, with no change to lifecycle costs and no programmatic impact.

Other Notifications

- **+$0.0M**, $10M in additional funding is provided to Glory from LDCM for increased risk reduction and to ensure that schedule is maintained. Refer to the FY08 Operating Plan for new life cycle cost change for Glory. The reduction to LDCM does not impact lifecycle cost or launch date.

Living With a Star

NASA Programmatic Changes

- **-$0.2M**, Reduction of Program-level reserves to fund additional Sounding Rocket payloads in Earth-Sun Research. No programmatic impacts.

Solar Terrestrial Probes

Enacted Appropriations Action (-$10.9M)

- **-$11M,** Rescind $10M of Magnetospheric Multiscale (MMS) funds plus $0.9M in indirect. Direct funds will be restored in future years, with no change to lifecycle costs and no programmatic impact to MMS, which is still planned for launch at the earliest possible date in 2014.

Explorer

NASA Programmatic Changes

- **+$0.0M,** +$5M in additional funding is provided to IBEX from THEMIS to allow for increased risk reduction and to ensure that IBEX schedule is maintained. There is no programmatic impact and no change to life cycle cost of either IBEX or THEMIS

Earth System Science Pathfinder

Enacted Appropriations Action (-$12M)

- **-$12M,** Rescind $10M of funds from Operating Missions, primarily Cloudsat and CALIPSO, with no programmatic impact, $0.6M of reserve not required for the JPL contract award fee, $0.4M of funds from program management activities, and $1M of indirect.

Earth-Sun Research

Enacted Appropriations Action (-$0.5M)

- **-$0.5M,** Rescind $0.5M of Earth Science mission operations and project management funds without impact to research activities.

NASA Programmatic Changes

- **+$0.2M**, Support two newly selected Heliophysics payloads for augmented Sounding Rocket program.

Applied Sciences

Enacted Appropriations Action (-$10.4M)

- **-$10.5M,** Rescind $9.5M plus $0.9M of indirect. The number of planned new awards from the current solicitations was reduced; no existing grants were impacted.

Education and Outreach

Enacted Appropriations Action (-$1M)

- **-$1M,** Rescind $0.9M of Fellowships and New Investigators funds plus $0.1M of indirect. No reduction to planned selections or funding levels.

Earth-Sun Technology

Enacted Appropriations Action (-$0.5M)

- **-$0.5M,** Rescind $0.5M in reserve not required for the JPL contract award fee.

EXPLORATION SYSTEMS MISSION DIRECTORATE

Constellation Systems

Enacted Appropriations Action (-$24.3M)

- **-$24.3M**, Rescind $20.3M from Ares and $2M from HQ Program Support, with $2M from indirect. No impact to program content. The need for these funds will be rephased to later years when required and will be supplied via reductions to program reserves.

Other Notifications

+$6.02M - FY 2007 programmatic Construction funds in support of Constellation increased from $83.8M to $89.82M

- **+$9.0M**, for major modifications to Space Power Facility at Plum Brook Station, Sandusky, OH. $42M initially funded under Shared Capability Assets Program (SCAP) in FY07, increased to a total of $55M, to include an additional +$4M in the FY08 operating plan. Cost increase due to expanded requirements of the Vibro-Acoustic Test Capability of the Reverberant Acoustic Test Facility (RATF), which provides additional capability to support future Constellation testing of larger diameter test articles consistent with Constellation long range planning.
- **-$9.5M**, for A-1 Propulsion Test Facility Modifications at Stennis Space Center. Original project estimate was $16.1M in FY07 and FY08 funds. Upon detailed requirements development, it was determined that this activity requires Special Test Equipment unique to the J-2X testing, which

will be purchased out of program funds, but only $0.5M in actual facility modifications in FY07 (included in the Minor category below) and $1 5M in FY08.

- **+$3.1M** - FY 2007 Minor Revitalization of Facilities Projects increased from $6.3M to $9.4M Adds new project, Repair of B-2 Vacuum System and Control Building (B-Complex) at Plum Brook Station, Sandusky, OH, to provide repair to critical systems and modernization. Adds funding to Construction of Abort Flight Test Launch Pad Complex at White Sands Missile Range, New Mexico; project cost increased due to changes in rocket motor integration requirements; $1.7M of the increase will be funded with Constellation R&D funds. Cancels three minor projects no longer needed due to maturing requirements.
- **+$3.42M** - FY 2007 Facilities Planning & Design increased from $15.4M to $18.82M, primarily due to additional requirements in the KSC VAB resulting from shuttle transition and additional safety analysis.

Exploration Systems Research and Technology

Exploration Technology Development

Enacted Appropriations Action (-$6.2M)

-$6.3M, Rescind 5.7M from Thermal Protection Systems activity and 0.5M from indirect. These funds will be recovered in FY08 via reprioritization of activity.

Robotic Lunar Exploration

Enacted Appropriations Action (-$13M)

- **-$9.9M**, Rescind from LPRP Future missions at HQ. These funds were reserved for undefined possible future mission activity and were not committed to any content.
- **-$2.0M**, Rescind from LPRP Program office. The Program was to propose tasks that would support technology needs for Constellation's lunar lander office and other concept designs. Proposals were made for specific efforts to invest most, but not all, of available FY07 funds. This reduction will not eliminate any planned work or program needs.
- **-$1.1M**, Rescind indirect

AERONAUTICS MISSION DIRECTORATE

Aeronautics

Aviation Safety Program

Enacted Appropriations Action (-$0.9M)

- **-$0.9M**, Rescind $0.8M from FY 2007 Congressional budget augmentation funds, plus $0.1M in indirect. Reduces support to the development of validation tools and methods for integrated vehicle health management systems.

Airspace Systems

Enacted Appropriations Action (-$1.7M)

- **-$1.7M**, Rescind $1.6M from FY 2007 Congressional budget augmentation funds, plus $0.1M from indirect. Reduces planned research on tradeoffs for the integration of advanced vehicles into NextGen. Result limits the number of advanced aircraft types, procedures and scenarios to be studied.

Fundamental Aeronautics

Enacted Appropriations Action (-$5.3M)

- **-$5.3M**, Rescind $4.9M from FY 2007 Congressional budget augmentation funds, plus $0.4M from indirect. Test opportunities for the Supersonics and Hypersonics projects in the areas of sonic boom, advanced nozzle development, and boundary layer transition will not be completed as planned. Instrumentation upgrades that were planned under the FY07 augmentation funding will also not be completed.

CROSS AGENCY SUPPORT PROGRAMS

Innovative Partnerships Program

Enacted Appropriations Action (-$23.8M)

- **-$23.8M**, Rescind $21.8M in funds in Small Business Innovative Research (SBIR) and in Small Business Technology Research (STTR) projects in excess of that required for FY07. Analysis of actual FY07 extramural R&D expenses reduced the total requirements for funding with FY07 funds. Based upon projected FY08 budgets, these funds are not needed to augment FY08 SBIR/STTR requirements, and can be rescinded. Commitments made for recent awards (120 Phase II awards announced October 11, 2007, and 302 Phase I awards announced November 16, 2007) will be honored and funded using FY08 funds, as necessary. This will likely result in fewer new awards than previously planned for FY08. Includes rescission of $2.0M in indirect funds.

NASA Programmatic Changes

- -$2.2M, Reallocate funds from excess SBIR funding to SCAP to fund consolidated microgravity aircraft services.

Strategic Capability Asset Program

NASA Programmatic Changes

- +$2.2M, Reallocate funds from IPP to fund consolidated microgravity aircraft services to support training, research and development, and education requirements

FY 2007 Updated Operating Plan
Enclosure 6 - FY07 Change Explanation
February 2008

SPACE OPERATIONS MISSION DIRECTORATE

Space Shuttle

Enacted Appropriations Action (-$19.3M)

- **-$3.4M**, Space Shuttle - Rescinded from indirect.

- **-$19.3M**, Hurricane Recovery - Rescind a portion of the funding provided in U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 (P.L. 110-28) for expenses related to the consequences of Hurricane Katrina. With the emergency supplemental funds for Katrina previously provided in P.L. 109-148 and P.L. 109-234, NASA has funded all recovery/operations and real property repairs at the Stennis Space Center and the Michoud Assembly Facility, and funded all high-priority catastrophic loss mitigation projects, including the widening of Route 607 through Stennis to facilitate emergency evacuation and improvements to the levies at Michoud. This rescission will remove or reduce in scope the lowest priority, discretionary risk mitigation projects, remove contingency funds, labor and travel that are not planned to be needed, as well as reductions in requirements for repair of one Space Shuttle external tank. There is no programmatic impact from this reduction.

Space and Flight Support

Launch Services Program

Other Notifications

- **+$0.45M**, Construction of Facilities. Due to the design effort taking longer than expected, the Building 836 HVAC revitalization project at Vandenberg AFB was delayed until the pricing analysis was completed. The original estimate done 2 years ago increased for rates and inflation.
- **-$0.45M**, Savings from the program's electric bill assessment and completing fewer modifications for facility operations and maintenance repairs are being transferred to support an increase to the Building 836 Heating Ventilation Air Conditioning (HVAC) Revitalization Project.

INSTITUTIONAL ACCOUNTS

Mission Support

Note: These amounts are not additive to the Program Rescissions noted in previous sections.

Corporate G&A

Enacted Appropriations Action (-$9.4M)

- **-$9.4M**, Eliminates flexibility for resolving the 13% cut in agency-wide and HQ activities in FY08.

Center Management and Operations

Enacted Appropriations Action (-$4.5M)

- **-$4.5M**, Eliminates flexibility to resolve problems that occur during FY08 operations in Center operations.

Institutional Investments

Enacted Appropriations Action (-$10.2M)

-$7.8M, Construction of Facilities

- **-$2.5M,** Deferred two FY07 Minor Revitalization projects at ARC that were scheduled for award in June.
- **-$2.7M,** Deferred one FY06 Minor Revitalization project at LaRC that was scheduled for award in March.
- **-$2.6M,** Residuals from prior years completed projects. These funds were to be reprogrammed to accomplish other critical facilities revitalization requirements.

-$2.4M, Environmental Compliance and Restoration

- **-$1.5M**, Reduction to Renewable Energy project at WSTF resulting in WSTF continuing to procure power off the electrical grid for an additional year.
- **-$0.9M**, Prior year recovery planning and deferral of some clean-up phases into FY 2009 impacts at LARC, KSC & JPL. No commitments are missed.
- Of these amounts, $0.5M is rescinded from FY07 funds, and $1.9M is rescinded from prior-year residuals.

Other Notifications

- Within the FY 2006 NOAA Applied Sciences Budget transferred to NASA (P.L. 109-108), Reallocate remaining $1.1M from Design of NOAA Science Center and Logistic Support Building (B3216 and B3205) at SSC to Construction of Support Building adjacent to NOAA Data Buoy Assembly Building (B3203) at SSC for a project total of $11.8M.
- SSC and The Infinity Science Center, Inc. (ISC), a private, non-profit entity of local interest, plan to construct a new visitor center at SSC. The total estimated cost is $18.5M, including $4M previously allocated in the FY 2006 Minor Revitalization budget, $2M (of the $9.6M) transferred to NASA from NOAA in FY 2006 for Infrastructure Improvements at SSC (P.L. 109-108), and $12.5M provided by ISC. SSC will provide all permitting, land clearing and improvements, installation of utilities, and other needed infrastructure improvements to support the construction of the new facility. ISC will construct, own and operate the facility under a long term lease property agreement with SSC.

On page Sup-38 of the NASA FY 2009 budget justification, we estimated our end of FY 2008 unobligated balances would be $1.764B. This represents 10 percent of our annual budget authority and is a 15 percent reduction from the unobligated balance at the end of FY 2007. This level is higher than we desire, and is primarily due to the delay in initiating procurement activities while under a Continuing Resolution, then waiting for Congressional concurrence on the initial Operating Plan, and the subsequent apportionment of funds from OMB. In FY 2007, the initial Operating Plan was not cleared by the Committees on Appropriations until May, with full funding apportioned and distributed in June. In FY 2008, the initial Operating Plan was not cleared until early March, with full funding apportioned and distributed by late March. With distribution of funding delayed so late into the fiscal year, it is impossible to complete all procurement activities before the end of the year.

Our business processes are designed for receiving an annual appropriation prior to the beginning of the fiscal year, which permits the initiation of all planned procurements. We are actively assessing our business processes across all of our programs to optimize decision-making and initiation of procurements under Continuing Resolutions when the authority to proceed exists under the Continuing Resolution, even if the final budget is uncertain. We are attempting to reduce our unobligated balance to $1.2B or less by year-end, which would be a 43 percent reduction from FY 2007, leaving unobligated balances at only 7 percent of total budget authority.

Any unobligated balances remain only to complete the activities for which they were originally appropriated. These balances are primarily associated with projects that have a definite and finite life cycle. As such, a delay in obligating these funds into the next fiscal year does not reduce the budget requirements for the next fiscal year. These balances also include unobligated funds associated with on-going construction projects and research funding for Science, Aeronautics, and Small Business Innovative Research that is in the final stages of review and selection.

QUESTION 6:

One of your cross-cutting science objectives for FY 2009 is to increase space science research and analysis grants. Adequate R&A funding is important to ensure that we are sustaining expertise in Space Science. In FY 2008 we provided funds above the request for R&A. Please provide a table showing how much funding is proposed for R&A in each section of the FY 2009 budget request compared to the amount provided in FY 2008.

ANSWER 6:

NASA's initial FY 2008 Operating Plan has increased funding for R&A, even above the levels enacted by Congress in the FY 2008 Appropriation. And the FY 2009 Budget Request includes further increases. The table below provides comparisons for R&A and similar competed research Projects (in $M).

PY07 Op Plan	PY08 Enacted	PY08 Op Plan	FY09 Budget	
32.5	30.9	33.1	33.9	Heliophysics R&A
52.2	50.3	56.61	61.4	Astrophysics R&A
111.7	123.6	141.7	142.4	Planetary R&A
11.9	10.0	15.7	18.8	Discovery Research
			8.1	Outer Planets Research
14.2	27.4	23.3	24.9	Mars R&A
135.9	141.9	133.9	136.9	Earth R&A
53.9	61.2	62.4	62.3	EOS Science
5.0	4.9	11.3	14.4	Space Laser Ranging
417.2	450.2	478.0	503.2	TOTAL

NOTE: With regard to NASA's Operating Plan only direct dollars are represented.

QUESTION 7:

I understand that your budget includes funding for a new start on a Joint Dark Energy Mission (JDEM). Does this correspond with the recommendations of the National Academy's Beyond Einstein Study that came out last year? How much is requested, both in FY 2009, and for the five year budget profile for JDEM? Will the

Department of Energy be a partner on that mission? Are the necessary interagency agreements in place for how the mission will be run? And how much funding is DOE putting up, and for what costs, compared to the amount in your budget?

ANSWER 7:

The National Academy's Beyond Einstein Program Assessment Committee (BEPAC) was formed at the request of NASA and DOE to recommend which mission in NASA's Beyond Einstein Program should be flown first. The Beyond Einstein Program mission suite consists of LISA (Laser Interferometer Space Antenna), Constellation-X, Inflation Probe, Black Hole Finder Probe, and the Joint Dark Energy Mission. The BEPAC recommended that JDEM be flown first, and following that recommendation, NASA and DOE are jointly working towards a JDEM launch in the 2014-2015 timeframe.

Currently the two agencies are developing a Memorandum of Understanding (MOU) that will detail the terms of the interagency collaboration and the respective roles and responsibilities each agency will assume. We anticipate that the MOU will be signed in May 2008. At the same time, NASA and DOE are working together on the JDEM Announcement of Opportunity (AO) that will formally solicit JDEM science investigations from the community. To facilitate the procurement process, the AO will be issued by NASA, but its content will have been agreed to by both agencies at the NASA Associate Administrator and DOE Under Secretary levels.

The President's FY 2009 budget request allocates $8.5M in FY 2009 and a total of $389M (all direct cost numbers) for the FY 2009-2013 period. The total cost of JDEM, including both agencies' contributions plus those from any international partners or other agencies, will be targeted at ~$600M (FY 2008$) plus the cost of the launch vehicle. The DOE will provide up to $200M for its contributions to JDEM, expected to be in the areas of scientific instrumentation, data processing and analysis, and requisite management.

QUESTION 8:

The New Millennium Program (NMP) is a technology development program to reduce risks and costs of future NASA Science missions. Your FY 2009 budget terminates the program, with the rationale that technology risk reduction is more productively funded within specific mission budgets where technology development is needed. Does your request then include increases in mission budgets where technology development requirements have been identified?

ANSWER 8:

No. Currently selected missions do not rely on yet-to-be-demonstrated NMP technologies, so their budgets do not need to be increased to support these technologies. Upcoming near-term mission selections (such as Small Explorers and Mars Scout) will be made before any additional NMP missions would have validated their technologies. Unselected far-term, future missions, with hypothetical technology needs, could conceivably have benefitted from some future NMP investment, but it is impossible to estimate such unknown requirements, which would be mostly beyond the current budget horizon (FY 2013) in any case.

QUESTION 9:

One of the largest areas of increase in the FY09 request is in Lunar Science Research budget. This item is increased by $50M above last year's runout. What has led you to redirect such a large sum to Lunar research? And what are the research priorities for that funding?

ANSWER 9:

The Presidents FY 2009 budget announced three new missions: a Lunar Atmosphere and Dust Environment Explorer (LADEE), to be launched in 2011, and two lunar landers, envisioned as part of an International Lunar Network (ILN) of geophysical stations, to be launched in 2013-2014. LADEE and ILN address two of the top Science Goals recommended in the National Research Council (NRC) 2007 report on The Scientific Context for Exploration of the Moon. The increase in the funding in the existing lunar science line was to begin the development of these missions.

The Planetary Science Subcommittee (PSS) of the NASA Advisory Council (NAC) Science Committee supports this substantial growth in robotic lunar exploration. In their last report on to the NAC on October 7, 2007, the PSS recommended that "NASA review the Lunar Precursor Robotic Program after LRO with the aim of devising innovative routes ... to undertake robotic exploration missions needed to initiate the next era of lunar and solar system exploration."

QUESTION 10:

In the past, Aeronautics Research cuts were justified by saying that NASA could end lower priority "demonstration" projects. However, we now have a National Aeronautics Research Policy, and corresponding Plan that guides the research, and no restrictions on the augmentations of funding that Congress has provided. Are you aligning the additional funding provided by Congress directly with the priorities described in the national policy and plan?

ANSWER 10:

The language in the Explanatory Statement accompanying NASA's FY 2008 Appropriations Act included recommendations from the Committees on the use of the additional augmentation funds for NASA aeronautics research. They offered guidance with regards to focus for our spending - "...the Appropriations Committees believe that a portion of the increase above the President's budget request should be applied to the research, development and technology demonstration activities of the Next Generation Air Transportation System (NextGen) to address Air Traffic Management (ATM) needs." They further stated; ". . . the Appropriations Committees expect a portion of this increase to address the top-ranked priorities of the National Academies' Decadal Survey of Civil Aeronautics." In addition, ". . . funding is proposed to carry out, with the goal of demonstrating in a relevant environment, research and development on engines and airframes that will result in significantly reduced energy consumption, emissions, and noise." To that end, "NASA is directed to utilize a portion of these funds for the development of a "green aircraft initiative." They also state that, "Air transportation is important throughout the world, but leadership in upgrading the air transportation system is absolutely vital to the U.S." They concluded by directing NASA ". . . to revalidate the NAOMS survey methodology and, if needed, to restart the NAOMS survey data collection activity as well as identify trends that may emerge. NASA should provide a report to the Congress within 90 days of enactment of this Act on its plans for completing the validation of the survey methodology and restarting the NAOMS survey data collection."

NASA's FY 2009 budget request for aeronautics research implements NASA's overall Aeronautics program under the Aeronautics Research Mission Directorate (ARMD), which NASA restructured in FY 2006 to focus on long-term, cutting-edge research in traditional aeronautics disciplines, as well as in emerging fields with direct applications to aeronautics. Under the restructuring, ARMD established four programs: the Fundamental Aeronautics Program, the Aviation Safety Program, the Airspace Systems Program, and the Aeronautics Test Program. Although the restructuring was conducted before the completion of the National Aeronautics R&D Policy, NASA's Aeronautics programs are strongly aligned with the principles of the policy because both took into consideration many of the same reports and studies that have been conducted over the past several years on the nation's aeronautics enterprise. The primary examples are:

- The Fundamental Aeronautics Program directly addresses the Policy's first principle of "mobility through the air" by conducting research that can enable the development of advanced aircraft systems that fly with higher performance, lower fuel consumption, and minimum environmental impact (noise and emissions) at a range of speeds and from a wide variety of airports. The Airspace Systems Program directly addresses this principle by conducting air traffic management research that will develop concepts, capabilities, and technologies required to meet the Nation's anticipated growth in airspace operations, both in the air and on the ground.
- Both the Fundamental Aeronautics Program and the Aviation Safety Program address the Policy's second principle of "national security and homeland defense" by conducting "dual-use" research in a number of areas including advanced aircraft design, integrated propulsion concepts, multi-functional materials development, and advanced aviation safety technologies.
- The core mission of the Aviation Safety Program directly addresses the Policy's third principle that states that aviation safety is paramount.
- All of ARMD's programs directly address the Policy's fifth principle of developing a "world-class aeronautics workforce" by focusing on cutting-edge research, and by fostering intellectual partnerships with industry and academia by means of cooperative Space Act Agreements and fully and openly competed research awards that emphasize true collaborations among partners. In addition, ARMD currently funds graduate student scholarships and intends to expand its scholarship efforts to include scholarships for undergraduates. Both the undergraduate and graduate scholarships will include summer internship opportunities at NASA research centers.

- The Fundamental Aeronautics Program simultaneously addresses the Policy's sixth principle of "assuring energy availability and efficiency" and seventh principle of "protecting the environment" by conducting research to improve aircraft performance, increase fuel efficiency, lower emissions (including particulate matter) and reduce noise. In addition, the Airspace Systems Program also addresses these two principles by conducting research to improve efficiency and reduce environmental impact through better utilization of the airspace.

The following provides details on NASA's allocation of the FY 2008 Congressional augmentation:

Aviation Safety Program
Enacted Appropriation Actions (+$6.0M)
Research activities conducted in the Aviation Safety Program focus on safety, which is defined in the National Aeronautics R&D Plan, Chapter 4: "Aviation Safety is Paramount."

The Aviation Safety Program was originally formulated in 1998 to develop technologies in support of a National Goal to reduce the U.S. aviation fatal accident rate by 80 percent by 2007. Building on that benchmark, the current Program, in collaboration with the Joint Planning and Development Office (JPDO), is now focused on developing technologies in support of the Next Generation Air Transportation System (NextGen) safety needs. In 2007, NASA and the JPDO reviewed and agreed on the alignment of the Aviation Safety Program research with the JPDO R&D Plan and Integrated Work Plan. Both of these key JPDO documents were used in defining the roadmap for the research for the National Aeronautics R&D Plan.

Chapter 4, focusing on safety, identify three specific goals:
1. Develop technologies to reduce accidents and incidents through enhanced vehicle design, structure, and subsystems.
2. Develop technologies to reduce accidents and incidents through enhanced aerospace vehicle operations on the ground and in the air.
3. Demonstrate enhanced passenger and crew survivability in the event of an accident.

The Program leads research activities for Goals 1 and 2. In particular, three of the four Projects within the Program contribute to Goal 1: the Integrated Vehicle Health Management (IVHM) Project, the Aircraft Aging and Durability (AAD) Project, and the Integrated Resilient Aircraft Control (IRAC) Project. The IVHM project conducts research to advance the state of highly integrated and complex flight-critical health management technologies and systems. The AAD project develops advanced diagnostic and prognostic capabilities for detection and mitigation of aging-related hazards. The IRAC project conducts research to advance the state of aircraft flight control automation and autonomy in order to prevent loss-of-control in flight. The fourth Project, the Integrated Intelligent Flight Deck (IIFD) Project, contributes to Goal 2. The IIFD project pursues flight deck related technologies that will ensure crew workload and situation awareness are both safely optimized and adapted to the future operational environment as envisioned by NextGen. A component of the IVHM Project, which focuses on research for new data-mining tools and methods, also contributes to Goal 2. Additionally, research within the AAD Project relative to aging hazards for materials and structures can be applied to Goal #3. 100 percent of the Program and Project budgets are focused on these goals.

The Aviation Safety Program received an additional $6.0M of augmented funds. Of that, $500K was directed to provide for an independent assessment of the NAOMS methodology by the National Academy of Sciences National Research Council (NRC). The remaining augmentation supported activities that aligned to the Goals listed above from Chapter 4, "Safety is Paramount" of the R&D Plan. Specifically, in alignment with Goal 1, an increased investment in the IVHM Project was made to support the development of new data mining tools that would be capable of analyzing large amounts of operational data in order to detect emerging aircraft and system safety risk. In alignment with Goal 2, investments in the IIFD Project were made to develop human-machine interfaces and procedures that would enable more effective task and attention management by the human operators. Additionally, a new investment that aligned with Goal 2 was made in the IVHM Project for system health monitoring of the NextGen airspace system and vehicles to understand and predict system-wide safety concerns through health monitoring of system-wide functions that are integrated across distributed ground, air, and space systems.

Airspace Systems Program
Enacted Appropriation Actions (+$20.0M)
All research activities conducted in the Airspace Systems Program; including these funded by the FY 2008 budget augmentation, focus on mobility, which is defined in the National Aeronautics R&D Plan, Chapter 2: "Mobility through the air is vital to economic stability, growth and security as a Nation."

From its inception, the Airspace Systems Program and its two projects (NextGen-Airspace and NextGen-Airportal) were planned using guidance from the Joint Planning and Development Office (JPDO) on the research and development that is required to achieve the Next Generation Air Transportation System (NextGen) vision. In 2007, NASA and the JPDO reviewed and agreed on the alignment of the NextGen-Airspace Project and NextGen-Airportal Project research with the JPDO R&D Plan and Integrated Work Plan. Both of these key JPDO documents were used in defining the roadmap for research for the National Aeronautics R&D Plan.

Chapter 2, focusing on mobility, identifies five specific goals:
1. Develop reduced aircraft separation in trajectory- and performance-based operations.
2. Develop increased NAS capacity by managing NAS resources and air traffic flow contingencies.
3. Reduce the adverse impacts of weather on air traffic management decisions.
4. Maximize arrivals and departures at airports and in metroplex areas.
5. Develop expanded aircraft capabilities to take advantage of increased air transportation system performance.

With these additional funds, Airspace Systems has initiated research in several broad areas.

1. In support of the NextGen R&D Plan, ASP will conduct R&D to validate NextGen trajectory-based operations by procuring software and simulation development capabilities in the areas of off-nominal scenario definition, integration of weather data with automation, and functional allocation between ground and aircraft for automated separation assurance.
2. ASP will establish a NASA Research Announcement (NRA) that promotes innovation in the foundational disciplines of navigation, control and avionics for autonomous systems, operations and decisions with broad potential application to ATM research.
3. ASP will accelerate R&D to validate and demonstrate the ability to safely transition new capacity-increasing capabilities and technologies into NextGen. This will include the development of an integrated test plan that identifies a series of phased simulations, demonstrations and trials to validate NextGen and the conduct of simulations to validate and demonstrate at least one NextGen concept that is under investigation by FAA-NASA-JPDO Research Transition Teams.

The first augmentation area supports Goal 3 of the Aeronautics R&D Plan, and funds research (in part, through an NRA) for the development of requirements for the integration of weather information into the ATM decision-making process and off-nominal scenario definition vital for NextGen. This work will contribute to the understanding of requirements for functional allocation between ground and aircraft for automated separation assurance.

The second augmentation area supports Goal 5 of the Aeronautics R&D Plan, and funds the establishment of an NRA that promotes innovation in the foundational disciplines of navigation, control and avionics for autonomous systems, operations and decisions with broad potential application to ATM research. This work will additionally address the Airspace Systems Program related top-ranked priorities of the National Academies' Decadal Survey of Civil Aeronautics.

The third augmentation area supports Goals 1, 2, and 4 of the Aeronautics R&D Plan. The Program leads numerous research activities for these goals with the collective research output of its two projects. Specific support from this augmentation area goes toward efforts to establish Research Transition Teams in partnership with the FAA and JPDO which teams collaborators at the research level in the organizations to effectively transfer NASA research results to FAA operations for NextGen. This will lead to validation and demonstration for advanced technology implementation.

Fundamental Aeronautics Program
Enacted Appropriation Actions (+$30.2M)
All of the research activities in the project plans in the Fundamental Aeronautics Program contribute directly to three of the principles outlined in the National Aeronautics R&D Policy:

1. Mobility through the air is vital to economic stability, growth, and security as a nation.
2. Aviation is vital to national security and homeland defense.

3. Assuring energy availability and efficiency is central to the growth of the aeronautics enterprise, and the environment must be protected while sustaining growth in air transportation.

The same approach to our alignment with the National Aeronautics R&D Policy and Plan was followed in allocating the additional funding provided by Congress in FY 2008: all additional efforts directly support specific items in the Plan.

More specifically, the additional funding will be used to expand opportunities for system-level fundamental research in the Subsonic Fixed Wing, Subsonic Rotary Wing, Supersonics, and Hypersonics projects that involve large-scale wind-tunnel and/or flight testing in support of NASA's mid- and long-term goals. These efforts largely involve system-level experimentation and design to ensure that some of the innovative foundational concepts and technologies already being pursued by the Program can be shown to be beneficial at the aircraft system level. Such efforts are specifically mentioned in the Goals & Objectives section of three Chapters of the Plan.

A number of these additional research opportunities target the integration of future vehicles and vehicle technologies into the NextGen. The main focus of the additional efforts is to ensure the robustness of the research program at the multi-discipline and system levels, and to address the significant integration challenges that result from the interaction of conflicting requirements that will need to be met by future aircraft. Key research issues to enable advanced vehicles (subsonic, supersonic, and rotorcraft) that can only be addressed at the system level will be pursued. NASA's aircraft research goals have been organized into three generations of vehicles beyond the current one, "N" (for which the Boeing 787 and Airbus 350 are representative vehicles). "N+1" represents the next generation of tube-and-wing aircraft with entry into service, market permitting, around 2015. "N+2" refers to advanced aircraft in the generation after "N+1," that are likely to use revolutionary configurations (such as hybrid wing-body, small supersonic jets, cruise-efficient short take-off and landing, advanced rotorcraft) and are expected to enter into service, market permitting, in the 2020–2025 timeframe. Investments include:

1. the advancement of hybrid wing-body vehicle ("N+2") technologies for low noise, higher performance, and better engine/airframe integration, that will include continued flight tests of the X-48B platform for acoustics validation data and large-scale airframe/propulsion integration demonstrations and data acquisition opportunities;
2. the system-level understanding of laminar flow control techniques for application in "N+1" concepts including the testing of a baseline open configuration that can be shared by the entire aerospace community and the acceleration of flight testing of promising technologies including the use of distributed roughness elements;
3. studies into the necessary technologies and integration approaches to realize significantly improved gas turbine engines;
4. efforts to assess the validity and applicability of biofuels/alternative fuels of various different sources to aviation applications; and,
5. approaches to improve the viability of both supersonic transports and advanced rotorcraft by conducting collaborative tests of fully integrated

airframe/inlet/engine/nozzle propulsion systems and actively-controlled rotors that use the twist of the blades to affect control.

Items 1, 3, and 5 directly contribute to the Goals & Objectives outlined in Chapter 2 of the Plan that focuses on mobility. In particular, these efforts directly impact Goal 5 of Chapter 2: "Develop expanded aircraft capabilities to take advantage of increased air transportation system performance." Items 2, 4, and 5 directly contribute to the Goals & Objectives of Chapter 5, which focuses on energy availability and protecting the environment. The impact of the various technologies being worked will be felt on both global emissions (by dramatically reducing the fuel burn of future aircraft and examining the possibilities of using alternative fuels for aviation) and local noise and emissions (in the airport/terminal areas). Finally, items 1, 3, and 5 contribute to the Goals and Objectives of Chapter 3, focusing on national security and homeland defense, by improving aerodynamic efficiency of fixed-wing aircraft and rotorcraft, and by improving the efficiency of future gas turbine engines.

Aeronautics Test Program (ATP)
Enacted Appropriation Actions (+$3.0M)
The Aeronautic Test Program (ATP) focuses on ensuring that NASA and the Nation have the right set of wind tunnel and flight test facilities in place and that these facilities are healthy and represent the capabilities that NASA and the Nation need to support the Nation's AeroSpace plans.

The ATP activities align with the goals of Chapter 6 of the National Plan for Aeronautics Research and Development and Related Infrastructure; specifically Goal 1: "Determine the national RDT&E infrastructure that satisfies national aeronautics R&D goals and objectives;" and Goal 2: "Establish a coordinated management approach for Federal RDT&E infrastructure that is based upon a national perspective and interagency cooperation." ATP initiatives are coordinated with the DOD through the National Partnership for Aeronautical Testing (NPAT) Council and with the U.S. aerospace industry through the U.S. Industry Test Facilities Working Group. This close coordination ensures a national perspective is inherent in the formulation and implementation of ATP plans.

ATP investments are targeted to ensure the reliability and continuous availability of a portfolio of NASA-owned flight test and ground test facilities, which are strategically important to meeting national aerospace program goals and requirements. Accordingly, additional funds provided to ATP in FY 2008 are being used to support the maintenance and repair project to replace the four water pumps and the associated electrical system at the Unitary Plan Wind Tunnel (UPWT) facility. These pumps provide water to the wind tunnel heat exchangers, oil house heat exchangers, drive motor blowers, and the electrolyte heat exchanger systems. The motors have been repaired on average every three years, often causing a major disruption in facility test operations. The UPWT supports major NASA programs and provides critical testing capability for programs such as an upcoming Sonic Boom investigation. In addition, the UPWT supports the aerospace industry and is critical to the design cycle development of commercial and military aircraft.

QUESTION 11:

There was a significant controversy last year surrounding the release of results from the National Aviation Operations Monitoring Service (NAOMS) safety analysis. In the FY 2008 bill Congress directed you to revalidate the survey methodology, and restart data collection if necessary. Have you completed this work? And can you tell us what you plan to do on NAOMS going forward?

ANSWER 11:

NASA has enlisted the National Research Council (NRC) to conduct an independent assessment of the NAOMS methodology. This assessment will be based on the redacted NAOMS survey response information that NASA has already placed in the public domain, including the final NAOMS contractor report, as well as various NAOMS project briefings. Currently, NASA and the NRC are discussing whether adequate protections can be established to allow the NRC to utilize unredacted survey response information for their assessment. An initial assessment is expected from the NRC by December 31, 2008, and the NRC will complete a final report by mid-2009. In addition to assessing the NAOMS methodology, the NRC could, if the methodology is determined to be valid, provide recommendations on the most effective ways to use the NAOMS survey response information. NASA will submit the NRC interim and final report to the Committees on Appropriations.

NASA has no plans to resume NAOMS data collection, or to perform trend analysis on the existing survey responses. NASA believes it would be premature to consider restarting NAOMS data collection until the NRC has completed the assessment of the original activity.

The original plan for the NAOMS project was a transition system to an organization with an operational focus. As a result, NASA transferred the NAOMS survey methodology to the Air Line Pilot's Association in FY 2006. This decision was also supported by the results of the 2004 National Academies' review and the fact that NASA has continued to support other independent aviation safety reporting systems such as the Aviation Safety Information Analysis and Sharing (ASIAS) system implemented by the Federal Aviation Administration (FAA).

Last year, a NASA team chartered by the Administrator examined the NAOMS survey response information collected by NASA from 1998 to 2004, and developed an initial redaction strategy and directed the Battelle Memorial Institute (NASA's contractor for the NAOMS project) in the execution of that strategy. The result was an initial release of redacted survey response information to the public on the NASA website on December 31, 2007. Since then, the website has been updated with additional data and information. In March 2008, the Associate Administrator chartered another NASA team to continue analyzing what additional survey response information can be released without compromising commercial confidentiality and anonymity. NAOMS survey respondents were promised that their responses would be confidential and not be traceable to any individual. It is vitally important to maintain the trust that has been established with the pilot community and minimize any adverse effects on future pilot reporting to other aviation safety systems. NASA plans to complete this team's effort by the end of this calendar year.

QUESTION 12:

Do we have enough information yet to be able to assess with confidence whether the life-cycle cost estimates for Orion and Ares are sufficient? When do you expect these vehicles to reach the crucial milestones that will reveal if the cost and schedule goals can be achieved? What milestones lie ahead in FY 2008 and FY 2009?

ANSWER 12:

Ares I and Orion are still in formulation phase. Firm cost/schedule estimates will be reported to Congress at the completion of the formulation phase and prior to entering development, consistent with NASA Procedural Requirements 7120.5, "NASA Space Flight Program and Project Management Requirements," and the reporting requirements of the NASA Authorization Act of 2005. NASA expects to be able to report life cycle costs for the Ares and Orion projects by the end of calendar year 2008.

NASA has a dedicated group of civil servants and contractors who work together to check and cross-check the multiple variables that go into designing and eventually operating these future Exploration vehicles. NASA has found no showstoppers in the Constellation Program, even though technical risks are a given in a program of this magnitude. NASA's current development projects within Constellation are not the leap forward in technology that previous efforts, such as X-33, were; this increases NASA's confidence in them. In addition, the Constellation Program utilizes an active risk management approach, which involves regularly identifying, evaluating, and retiring the risks, which are affecting the program.

Last year, Constellation completed a "Season of System Requirements Reviews" for the program and its projects. Design reviews are essential to good engineering practice. The year culminated with an Orion Point-of-Departure design and a green light to move forward to the Preliminary Design Review (PDR). An Integrated Stack Technical Interchange Meeting also was a great success, with all top issues being resolved. Thus, the Constellation program was able to strike a technical baseline from which integrated assessments can be formed. The program closed the architecture for going back to ISS; has identified the areas necessary to do the same for lunar; and now has a clearer understanding of its growth path toward that goal. Constellation also has the green light to move forward in developing systems for a lunar capable vehicle that meets our budgets and schedule needs. Agency leadership has embraced the results of this season of reviews and has approved the Constellation program to move forward to PDR for both Orion and Ares I by this fall.

Additionally this year, Constellation will be busy with hardware activities, which include fabrication of the First Stage Development Motors 1 and 2 for Ares I; complete construction of the Upper Stage Common Bulkhead Demonstration article, and will deliver the first Ares I-X demonstration test flight hardware to Kennedy

Space Center, Florida, in October 2008. Orion will be just as busy, culminating the year with a test of its launch abort system at the U.S. Army's White Sands Missile Range in New Mexico.

This December, NASA expects to complete the integrated stack sync point for Orion and Ares I, which is a key milestone in the development progress of these projects. The integrated stack sync point will demonstrate that Ares I and Orion preliminary designs, as well as the integrated stack analyses, have met all system requirements within acceptable risk and within the cost and schedule constraints. The sync point establishes the basis for proceeding to the Constellation Program-level PDR. The integrated sync point also will show that the correct design options have been selected; interfaces have been identified; and verification methods have been described. The Orion and Ares I project offices are currently finalizing data products required to meet their individual project-level PDRs.

Next spring, the Ares I-X test flight will be the first demonstration flight of the technologies for and components of the new U.S. Exploration launch vehicle system. Important technical highlights of the Ares I-X test flight are: demonstration of First Stage separation sequencing; an assessment of First Stage atmospheric reentry characteristics; an assessment of vehicle roll torque while in flight; and a demonstration of assembly and recovery activities for a new launch vehicle at KSC. And later next year, Constellation expects to hold the Integrated Stack PDR after the Orion, Ares, Ground Operations and Mission Operations complete their PDRs. In addition, NASA plans to hold a Critical Design Review (for the Ares Upper Stage Engine, J-2X), and will have a ground test of the Ares first stage Demonstration Motor 1.

QUESTION 13:

NASA's first funded COTS partner has completed the first eight milestones on schedule. However, you recently announced that their first commercial demonstration launch will slip by 6 – 9 months. What affect will this have on the overall development effort?

ANSWER 13:

In early February, SpaceX formally notified NASA that they are projecting a six to nine month delay in the launch of their Falcon 9 launch vehicle and Dragon spacecraft demonstration missions. The first orbital demonstration milestone, originally scheduled for September 2008, is projected to launch in June 2009. The third and final demonstration milestone, a mission to the ISS, is now planned for March 2010, delayed from September 2009. The delay is primarily due to technical issues, recently resolved, with the new Merlin 1C engine and launch site preparations at Cape Canaveral. The demonstration launches were previously planned to be conducted from Kwajalein in the Marshall Islands. To date, SpaceX has met all of its technical and financial milestones. SpaceX delays related to the Merlin 1C engine are typical in the industry when developing a new rocket engine. Site preparations at Cape Canaveral are simply taking longer than expected.

Other than the recently projected demonstration delay, which will still have the final demonstration flight occur prior to retirement of the Shuttle, the overall development effort is on track and going well.

QUESTION 14:

What is the earliest that a commercial cargo capability to the ISS could be operational?

ANSWER 14:

Both of the funded COTS Phase 1 partners, SpaceX and Orbital Sciences Corp., plan to demonstrate cargo mission capabilities to the ISS in CY 2010. NASA has identified ISS commercial cargo requirements in the 2010/2011 timeframe. NASA is in the process of procuring commercial cargo services through the ISS Commercial Resupply Services acquisition. The request for proposals (RFP) was released in mid-April, with an award expected in November 2008. The date an operational capability will be available will be driven by the responses industry provides to the Government RFP.

QUESTION 15:

What is the total amount in your budget plan for COTS, and what does that support? Is there any funding requested to make progress on a commercial human transport capability, referred to as "Capability D"?

ANSWER 15:

In FY 2009, NASA is requesting $173M for the Commercial Crew and Cargo Program and its associated Commercial Orbital Transportation Services (COTS) project. Full funding is essential to maintaining NASA's promised $500M investment in this program to spur the development of U.S. commercial space transportation services to and from LEO while also providing substantial savings to the taxpayer compared to NASA Government-owned and operated capabilities.

Altogether, NASA is providing about $500M over five years to stimulate the commercial space transportation market to help develop safe, reliable and cost-effective access to and from LEO:

- In August 2006, NASA signed a funded SAA with Space Exploration Technologies Corp. of El Segundo, California, also known as SpaceX. The company is scheduled to receive $278M to supplement its privately funded efforts and is planning to conduct a demonstration flight to the ISS in March 2010. In early February, SpaceX formally notified NASA that it was projecting a six to nine month delay in the launch of the Falcon 9 launch vehicle and Dragon spacecraft demonstration missions. On February 28, 2008, NASA executed an amendment to the SpaceX SAA, renegotiating milestones to align the current development and demonstration schedule with ISS integration activities. In addition, several new milestones were added and others modified to allow additional insight and clarification to objective measures of progress for the demonstration. SpaceX has met all milestones to date and continues to make excellent progress in the development of its launch vehicle and cargo capsule. While the amount of the individual performance payments for some milestones has been adjusted, the total NASA investment in this agreement of up to $278M remains unchanged. SpaceX has received a total of $139M for successfully completing the first eight milestones

- On February 19, 2008, NASA announced the selection of Orbital Sciences Corporation of Dulles, Virginia, for a second funded SAA. Orbital will receive approximately $170M to supplement its privately funded efforts and is planning to conduct a demonstration flight to ISS in December 2010. Orbital Sciences' plan does not include a demonstration of Capability D.

- NASA also has entered into unfunded SAAs with five other companies – Constellation Services International, PlanetSpace, SpaceDev, SpaceHab, and Transformational Space Corp (t/Space).

Capability D is not funded as part of NASA's current budget. NASA believes it is prudent to require first the successful demonstration of an orbital cargo mission before considering additional investment in the more difficult crew transportation capability.

QUESTION 16:

Is accelerating funding for Capability D something you are actively considering? Why or why not?

ANSWER 16:

Capability D is not funded within the existing budget plan, and, NASA has no plans to accelerate Capability D within the existing budget plan. Instead, NASA is first requiring the successful demonstration of an orbital cargo mission before considering additional investment in the more difficult crew transportation capability. Some of the top risks associated with approaching and berthing with the ISS are common to both cargo and crew missions and waiting for successful cargo mission demonstrations will close these risks before placing additional crew in the mix. In essence, NASA believes it is important to first demonstrate cargo services before even considering a demonstration of the transportation of our most valuable commodity – American astronauts.

QUESTION 17:

Congress gave you an expanded leasing authority last year that is slated to go into effect at the end of December. How does that intersect with your strategy of retiring equipment and facilities as part of Shuttle Transition, and do you have all the leasing authorities you need in that regard?

ANSWER 17:

NASA received expanded Enhanced Use Lease (EUL) authority in its FY 2008 appropriation. This authority expands NASA's previous EUL authority beyond the two Centers in the demonstration program to all NASA Centers. The authority allows NASA to enter into leases of its underutilized property with other agencies, state and local governments, and the private sector, and to retain the proceeds of the lease for use on its capital assets. This authority is important to NASA's ability to transition its facilities and infrastructure to support NASA's mission by allowing the Agency to pursue innovative use strategies and partnerships to reduce cost and maximize performance in its infrastructure portfolio. One of NASA's goals in effecting transition from Space Shuttle to Constellation is to improve infrastructure performance by using EUL authority to engage with appropriate tenants for these facilities. When combined with our other authorities in the Space Act, this expanded EUL authority will provide NASA with powerful tools to aid the Agency in seeking new ways to ensure maximum performance across its infrastructure portfolio.

QUESTION 18:

Your manifest shows two Shuttle contingency flights in 2010. Does your budget include funding for these flights? When will a decision be made to fly these missions or not? What are the budgetary impacts of those decisions?

ANSWER:

The Space Shuttle budget includes funding for the two flights, but the final approval decision to fly them has not yet been made. NASA will continue to monitor the on-orbit performance of ISS hardware and systems and determine whether to launch the two contingency flights as we approach Shuttle retirement in FY 2010. The decision to fly will be based on the Shuttle's retirement timeline and whether or not the contingency missions can be flown safely within the envelope of that timeline. These flights include spares that are designed to fly on the Shuttle. These flights also include the stowage pallets used to attach these spares to ISS. Further, these flights contain some hardware being flown to satisfy international partner agreements and additional orbital debris shielding for the ISS. The stowage pallets are as important as the spares themselves. These pallets provide a location to store spares for delivery via commercial cargo delivery, as well as external payload accommodation. Without these stowage pallets there would be very limited external stowage and external science locations on ISS.

QUESTION 19:

Your five-year budget includes a significant increase to reflect the latest cost estimates to carry anticipated cargo to the International Space Station. What is the magnitude of the increase above the previous budget runout, and can you explain what justifies the increase in these estimates?

ANSWER 19:

The ISS Cargo Crew Services line continues to change as the project matures and costs are refined. The ISS Cargo Crew Service budget was transferred from ESMD to ISS in the FY 2008 President's budget. At that point in time, NASA had estimated a potential shortfall for ISS Cargo Crew Services. In order to mitigate this risk, ESMD and ISS held liens within their budgets to address the potential shortfall. In the FY 2009 President's budget request, $823M in funding associated with those liens was formally transferred to ISS Cargo Crew Services. There continues to be much uncertainty in the cost and availability of cargo and crew transportation services. In FY 2007, NASA signed an agreement with the Russians, which finalized our costs for Russian transportation services through 2011. In April 2008, NASA released a Request for Proposal (RFP) for Cargo Resupply services. Once industry proposals are received, NASA will have a better understanding of the potential cargo transportation costs and expects to have a further refinement in the FY 2010 budget request.

Written questions submitted by Rep. Culberson resulting from the March 5-6, 2008, hearing before the House Subcommittee on Commerce, Justice, Science and Related Agencies regarding NASA's FY 2009 Budget Request.

MSL Impacts on Mars Scout 2013

QUESTION 1:

We understand there are delays in the Mars Science Lab and cost overruns on the order of $165M to date, will this affect the already delayed Mars Scout scheduled for launch in 2013 which as you know, if we do not meet the 2013 launch date, the next launch opportunity isn't until 2016?

ANSWER:

The MSL project is still on track to meet the 2009 launch date. The reported delays were in subsystems against the originally planned delivery dates, and there still are schedule pressures from subsystem production and deliveries. These delayed deliveries have been accommodated in the MSL integration schedule that meets the 2009 launch, but NASA and Jet Propulsion Laboratory (JPL) senior management are closely monitoring these deliveries on a weekly basis. Additionally, NASA has had JPL establish a clear set of metrics to track subsystem delivery progress, which is also reviewed weekly. At this time, there is no effect on the Mars Scout 2013 schedule. NASA and JPL have also been keeping a close eye on the cost implications of MSL's technical and schedule issues. NASA notified the Committees on Appropriations in the initial FY 2008 Operating Plan that MSL was under review. In addition, in accordance with Public Law 109-155, Section 103, paragraph (c)(2), NASA notified Congress on May 1, 2008, that the development cost of MSL will likely exceed the Major Project Annual Report estimate by more than 15 percent. NASA is also developing a more detailed report, pursuant to section 103(d)(1) of the Act.

Welding approach on Constellation

QUESTION 2:

What technology is NASA currently using for welding on Constellation and what is NASA doing to make sure the welding technique for Constellation is state-of-the art, 21st century technology?

ANSWER:

The Ares I project office has baselined Friction Stir welding as the primary welding processes for manufacturing the Upper Stage. Friction Stir Welding (FSW) is a solid-state joining process (meaning the metal is not melted during the process) and is used for applications where the original metal characteristics must remain.

The Ares Project office is currently designing and implementing FSW demonstration tooling at the Marshall Space Flight Center to be used to manufacture Ares I upper stage demonstration hardware. As designs mature, FSW technology will be installed at the Michoud Assembly Facility to support upper stage or propulsion vibration test articles and flight hardware manufacturing.

Funding Required to Accelerate OPF

QUESTION 3:

Do you think extra funding could allow the Outer Planets flagship mission to possibly launch by 2014? How much extra funding in the coming years would that take?

ANSWER:

NASA's current plans for the next Outer Planets Flagship (OPF) involve a possible partnership with the European Space Agency (ESA). NASA and ESA are jointly studying two types of missions in the Jupiter system and one in the Saturn system. This approach is modeled after the tremendously successful joint NASA/ESA Cassini-Huygens missions. ESA's contribution may be as much as $1.0B. As the size of ESA's contribution and the OPF destination and launch date are under review and the current studies won't be complete until later this year, it is too early to estimate what impact changes in the funding level or profile are likely to have on the planned launch date for the OPF mission.

Space Interferometry Mission (SIM)

QUESTION 4:

Could you provide specific details on how SIM funding will be spent in the FY08 operating budget?

ANSWER:

The Explanatory Statement accompanying the FY 2008 Omnibus Appropriations Act (P.L. 110-161) identified an augmentation of $38.4M, for a total of $60.0M, to initiate the development of SIM. However, an immediate start of development for a flagship SIM mission would result in costly delay or termination of many other projects in the Astrophysics portfolio, thus eliminating diversity and balance in the Astrophysics portfolio, and would be inconsistent with the recommendations of the National Research Council (NRC) and NASA's other advisory committees.

Therefore, in its initial FY 2008 Operating Plan, NASA explained its plan to use the $60.0M appropriated to continue the formulation of SIM and to conduct studies for additional techniques to detect Earth-size exoplanets. Specifically, NASA plans to do the following in FY 2008 and FY 2009:

- Complete the detailed formulation phase (including cost and implementation plan) of a of a "SIM-Lite" mission that would meet the recommendations laid out in the two most recent Decadal Surveys for an Astrometry Astrophysics Mission, capitalizing on the previous technology investment to develop an affordable mission.
- Study a number of Earth-like exoplanet detection techniques, including astrometric techniques, which would be guided by the recently completed Astronomy and Astrophysics Advisory Committee Report on Exoplanet Studies Roadmap

The results of these activities would guide NASA's planning for FY 2010 and beyond, leading to a launch by the middle of the next decade of a medium-scale exoplanet exploration mission. NASA has made the decision that JPL will manage the next exoplanet mission. As a result, NASA expects that the activities outlined above would, for the most part, be conducted at JPL, in collaboration with the broader science community, industry, and other NASA Centers. The core competency that NASA has developed over the last decade at JPL will be leveraged to support a vigorous exoplanet exploration program within a scientifically and programmatically balance Astrophysics portfolio.

Consistent with the FY 2008 Operating Plan, NASA's FY 2009 budget request reflects a total of $272.0M for FY 2009-2013 for a new medium class exoplanet mission.

Written questions submitted by Rep. Latham resulting from the March 5-6, 2008, hearing before the House Subcommittee on Commerce, Justice, Science and Related Agencies regarding NASA's FY 2009 Budget Request.

Foreign Contracts

GAO has noted that NASA has had difficulty in tracking information related to its foreign supplier contracts.

QUESTION 1:

Can you tell us the percentage of your resources that you spend on acquisition of supplies and services, and of that percentage, how much is related to foreign suppliers?

ANSWER:

In FY 2007, procurement obligations represented approximately 81 percent of NASA's budget. NASA obligated $14.363B on the acquisition of supplies and services in FY 2007, of which $209.4M, or 1.5 percent, was related to foreign suppliers.

QUESTION 2:

NASA has been criticized in the past for not tracking data on foreign contracts. Has the agency improved in tracking these contracts, and what steps have been taken in this regard?

ANSWER:

NASA relies on information contained in the Federal Procurement Data System – Next Generation (FPDS-NG) to obtain information on Federal contracts. FPDS-NG provides data on place of performance and vendor addresses, allowing NASA to collect reliable information on prime contracts with foreign suppliers.

Further, NASA continues to partner with the Office of Management and Budget and other Federal agencies in the development and implementation of a Government-wide subcontract reporting system.

NASA Information Security

QUESTION 3:

In the past, I have raised the issue of NASA information security technology systems – a subject also raised by the NASA IG. Can you summarize the steps you have taken in the last year to address these concerns?

ANSWER:

Over the past year, NASA's Office of the Chief Information Officer (OCIO) has aggressively pursued enhancements to NASA's Information Technology (IT) Security Program. A number of enterprise security initiatives have been implemented in concert with several major enterprise infrastructure initiatives that contribute significantly to NASA's overall security posture.

In FY 2007, NASA met its goal of certifying and accrediting 95 percent of the 809 Agency and contractor systems and networks that comprise the NASA computing environment. Certification is the process of verifying that security controls are in place and validated through comprehensive testing that the controls are operating as they are intended. Accreditation is the processes where a senior Agency official formally acknowledges that the system has met certification requirements and grants the system the authority to operate. This activity was critical to meeting the requirements of the Federal Information Security Management Act (FISMA) and improving the Agency's security score under the Presidential Management Agenda for E-Government. In addition, NASA provided IT Security awareness training to more than 94 percent of its employees and contractors as required under FISMA and verified by the NASA Office of the Inspector General (OIG).

Some of the specific security initiatives that NASA has implemented include the establishment of an Agency wide IT Security Program Management Office (ITS PMO). The ITS PMO is charged with the promulgation of security strategies and solutions throughout NASA.

The ITS PMO currently has a number of enterprise focused security projects in operation or being readied for deployment. These projects include development of a security architecture, IT security training and privacy activities, vulnerability and threat assessments, situational awareness operations, and the implementation of an encryption solution for all NASA mobile devices.

One of the most notable security enhancements that NASA has begun to implement is the Security Operations Center (SOC). When completed, the SOC will provide NASA with end-to-end visibility of its networks and the ability to detect cyber attacks directed against those networks and information systems. This visibility will significantly improve NASA's incident management capability by providing more rapid detection, response, tracking, mitigation and reporting of cyber based attacks. The SOC will provide 24x7x365 monitoring of NASA's networks, supported by a global call center and the capability to perform forensics analysis and decomposition of cyber attacks.

As mentioned earlier, the OCIO is in the process of implementing several enterprise-wide IT infrastructure initiatives that have a direct and positive impact to improving IT security at NASA. Some of the most notable initiatives include:

- Standardization and Consolidation of Remote Access;
- Implementation of Two-Factor Authentication (forcing strong user authentication to NASA information resources);
- Standardization and Consolidation of Firewalls; and,

- Establishing Demilitarization Zones (DMZ, segregating publicly available and internal services and moving each into their own access-controlled environment).

NASA remains committed to enhancing and improving its IT Security posture and has partnered with the Office of Security and Program Protection (OSPP) as part of a comprehensive strategy. This partnership has already witnessed high-yield results and has resulted in the establishment of additional partnerships to include the Department of Defense and agencies with the Intelligence Community with a strong emphasis on improving IT security practices and responding to emerging threats.

NASA has made significant improvements in the area of IT security, and will continue these efforts until the full benefits of a sound IT security posture are achieved.

Research Training Opportunities at the University Level

QUESTION 4:

What role do you believe is best served by the university research community in the space and Earth sciences?

ANSWER:

The university research community is essential for advancing NASA's strategic objectives in science and for realizing the Nation's return on investment from NASA's Earth and space science programs. Discoveries and concepts developed by the university research community are the genesis of scientific priorities, missions, instrumentation, and investigations. Although not always tied to specific missions, the tasks funded in the university research community add value to missions in the form of post-mission data analysis, observations required for mission design, mission observation support, and joint scientific campaigns.

More than two-thirds of NASA sponsored Earth and space science research is conducted by the university community. Without this research, NASA's expensive science missions would only yield a stream of ones and zeros from space. The university research community converts the data from NASA's science missions into discoveries, knowledge, understanding, and more questions. Those new questions are what drive the research and development leading to the next generation of space missions.

The university research community is also an essential partner in workforce development for NASA and the Nation. The university-based research and technology projects spon-sored by Science Mission Directorate allow students and post-doctoral researchers to gain invaluable NASA science program work experience as part of their education and professional training. The suborbital programs (airplanes, unmanned aerial vehicles (UAVs), rockets, and balloons) and principle investigator-led missions enable students to participate in the entire lifecycle of a science mission from design and construction to flight and data analysis. These hands-on opportunities lead to experienc-es in problem solving and increased understanding of the systems engineering that is the underpinning of successful science missions.

Written questions submitted by Rep. Aderholt resulting from the March 5-6, 2008, hearing before the House Subcommittee on Commerce, Justice, Science and Related Agencies regarding NASA's FY 2009 Budget Request.

QUESTION 1:

It is my understanding that there have been some glitches in development of the Ares I launch vehicle. Of course all major programs have glitches of some kind. How confident are you that all such glitches will be overcome without having to push back the expected launch date?

ANSWER 1:

I am very confident. During the design analysis cycle of the Ares I Crew Launch Vehicle, NASA analysis concluded that a thrust oscillation issue existed during First Stage operation. Thrust oscillation is a common risk in solid rocket motors like the First Stage of the Ares I launch vehicle.

From a design perspective, it was beneficial to identify this early in the development process, allowing solutions to be implemented before Ares and Orion enter the detailed design phase. NASA has followed a classic systems engineering approach in addressing this issue – bringing in a diverse set of experts, identifying root causes, understanding sensitivities, investigating parallel mitigation paths and implementing solutions based on risk. As a result, we have an understanding of stack dynamics and internal motor flow dynamics that is unprecedented this early in a development program.

In November 2007, NASA chartered the Thrust Oscillation Focus Team (TOFT) to review the forcing functions, models and analysis results to verify the current predicted dynamic responses of the integrated stack, identify and assess options to reduce predicted responses, validate and quantify the risk to the Ares I vehicle, Orion spacecraft, crew, and other sensitive subsystems and components to the extent allowed by the Ares I/Orion design maturity, and establish and prioritize mitigation strategies and establish mitigation plans consistent with the CxP integrated schedule.

Mitigation strategies being reviewed include reducing or eliminating the forcing function; canceling or isolating the forcing function; de-tuning the stack from the forcing function; and reducing loads conservatism that initially made the scale seem more serious. NASA is evaluating tuned mass absorbers to reduce loads. We are collecting motor performance data on the upcoming Ares 1-X and Shuttle flights as well as launch acceleration data at the crew seats. NASA chartered a small team to evaluate and propose potential concepts to de-tune system frequencies. Finally, we are evaluating internal motor design modifications that could potentially reduce thrust oscillation.

TUESDAY, FEBRUARY 26, 2008.

OFFICE OF SCIENCE AND TECHNOLOGY POLICY

WITNESS

JOHN H. MARBURGER, III, DIRECTOR

CONGRESSMAN MOLLOHAN OPENING REMARKS

Mr. MOLLOHAN. Good morning. I would like to welcome all the members, staff and agency witnesses and the public to the Commerce, Justice, Science and Related Agencies Appropriations Subcommittee's first hearing of the second session of the 110th Congress.

There are many fresh faces here on the subcommittee staff, some familiar, others new, but I want to welcome them and encourage you all to reach out to them.

This year, like the last, will be another busy year with a fast-paced hearing schedule, but this time it will be wedged into an election year. We surely have our work cut out for us, but I hope and expect this year to be exciting and productive. I am certain, given my past experience in working with the ranking minority member of the subcommittee, Mr. Frelinghuysen, that it will be a cooperative one.

Before we proceed with this morning's hearing, I want to reiterate this subcommittee's procedures.

For purposes of asking questions, I will recognize members arriving prior to the beginning of the hearing in the order of seniority. And then, for those arriving after the start of the hearing, I will recognize them on a first-come, first-served basis.

All members will have 5 minutes of questioning during the first round, 10 minutes in the subsequent rounds. And in order to ensure that all members get to ask questions—Rodney, you and I will abide by this, and then we will inform people as they come in—that they respect the time restrictions.

I ask, Doctor, that you keep your oral remarks to 10 minutes or so. And we won't be as restrictive with you, as your prepared statement, as you know, will be made a part of the record.

This year's first witness before the subcommittee is Dr. John Marburger, III, the director of the Office of Science and Technology Policy for the executive branch of the President. Dr. Marburger serves as the senior advisor to President Bush and also co-chairs the President's Committee of Advisors on Science and Technology and supports the President's National Science and Technology Council.

We are here today to more fully understand the President's proposals for Federal research and development across our Government, with particular interest in NIST, NSF and NASA. Our Nation's investments in science and technology; our place in the world and how it is threatened; and how we, as a Nation, must respond to the narrowing gap. Collectively and cooperatively, we must ensure that limited Federal resources are optimally invested to sustain U.S. leadership in science and technology.

Dr. Marburger, I would like to welcome you to the hearing today. Thank you for your good service to the President, to the administration and to the Nation. We are really pleased to see you here this year, and we are sorry that you weren't able to be with us last year, which we understand, but we are really glad to see you here this year, for all the obvious reasons.

And before turning to you, Doctor, I would like to recognize the ranking member of this subcommittee, Mr. Frelinghuysen, for any opening comments that he may wish to make.

CONGRESSMAN FRELINGHUYSEN OPENING REMARKS

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman. I look forward to working with you, as we go through the hearing process here, and having the active involvement of all members of the committee.

I am pleased to join Chairman Mollohan this morning and welcome you, Dr. Marburger, to testify on the Nation's science and technology policies and priorities, as well as the appropriations request for the Office of Science and Technology Policy in the Executive Office of the President.

First, let me congratulate you and the administration. You are again representing a very strong budget request for basic scientific research under the American Competitiveness Initiative, particularly for the National Science Foundation and for the National Institute of Standards and Technology under this subcommittee's jurisdiction.

This request for NSF is an increase of 13.6 percent, and the request for NIST core research is 21.5 percent. When you consider the overall non-security discretionary budget is under 1 percent, it is clear that science is at the very top of the administration's budget priorities.

Congress has endorsed in this committee large increases for science budgets in both the America COMPETES Act and in the appropriations bills for the last 2 years. So I think you will continue to find broad bipartisan support for the increases you are proposing.

However, like other committees, this one operates in a climate of limited resources. At the same time the administration hands us this outstanding science request, we have other areas, including State and local law enforcement, all of which are popular and necessary, where deep and unsustainable cuts are proposed. All of it comes from the same allocation. The Chairman and the subcommittee have had a historically very difficult task in balancing these priorities, and this year will be no exception.

You are here to testify in support of your own OSTP budget request, for which you are proposing a modest 2 percent increase. I and all of us look forward to your testimony, and we will have specific questions later on.

Thank you, Mr. Chairman.

And thank you, Dr. Marburger, for being with us this morning.

Mr. MOLLOHAN. Dr. Marburger.

Mr. MARBURGER. Well, thank you, Chairman Mollohan and Ranking Member Frelinghuysen and members of the subcommittee as they appear. I am very pleased to appear before you once again after a gap of a year to present the President's fiscal year 2009 research and development budget.

My written testimony has more detail about the overall budget, and I know you have considerable detail about the agencies that we will talk about, so I will make my oral remarks brief, and I will answer questions to the extent I can. And if I can't do it here, I will do it in writing. And I want to make sure that we are all clear about this budget.

First, I want to thank this subcommittee for its support of the President's American Competitive Initiative through the initial House passage of the fiscal year 2008 Commerce Justice, Science and Related Agencies Appropriations Act. Unfortunately, the provisions of that act were not ultimately included in the 2008 omnibus funding bill. But the President remains committed to the ACI and is once again requesting funds to ensure America's future economic competitiveness.

The ACI and the ACA, the America COMPETES Act of 2007 that the President signed last summer, do respond to recommendations from a wide range of scientists, business and educational leaders and they're many organizations who believe Federal actions are needed to ensure America's future leadership in science and engineering—fields that are essential to the processes of innovation that lead to long-term economic competitiveness. And I look forward to working with this subcommittee to address the important goals of these initiatives.

While the President's fiscal year 2009 budget substantially funds authorizations under the COMPETES Act, of the $13.8 billion authorized in fiscal year 2009 in the act, the President's budget funds $12.2 billion, or 85 percent, which, in total, compares favorably with the 82 percent level at which Congress funded the act last year in the omnibus bill.

If the President's request is funded, the COMPETES Act budgets would grow by almost 15 percent. To place this in context, as Ranking Member Frelinghuysen has noted in his opening remarks, the President's overall request for all non-defense R&D increases by 6 percent, compared with the remainder of the non-security discretionary budget which increases by less than 1 percent.

In constant dollars, growth and outlays in non-defense R&D have increased by nearly a third under this administration. Total Federal R&D in the 2009 budget stands at $147 billion, an increase of $4 billion over last year's appropriated amount, which represents $1 out of every $7 requested by the President in the discretionary budget, a growth of 61 percent during this administration. So it is just an extraordinary record for the R&D budget of this Nation.

My written testimony summarizes the President's request for several key research programs that cut across agencies and gives somewhat more detail for the agencies under the jurisdiction of this subcommittee.

Overall, the President is requesting an increase of $850 million in the basic research category, for a total of $29.3 billion in basic research, which includes a 15 percent increase of $1.6 billion for the three agencies that are prioritized in the American Competitiveness Initiative: the National Science Foundation, the Department of Energy's Office of Science, and the laboratories of the National Institute of Standards and Technology.

Basic research at the Department of Defense, which is another important priority for us, would grow by 19 percent, or $270 million, over the fiscal year 2008 request.

The budget provides for key multi-agency science programs, including more than $2 billion for climate science, a 12 percent increase over the 2008 enacted, and an increase of about 9 percent for the entire range of climate-related activities, including science, technology, international assistance, and tax incentives. The total climate package in this budget is nearly $9 billion when everything is taken into account.

The budget includes increased funding for a number of Earth observation programs: $74 million for NOAA for certain climate sensors that had been demanifested from the National Polar-Orbiting Operational Environmental Satellite System, otherwise known as NPOESS; there is $103 million for NASA to begin a series of Earth observing missions recommended by the National Research Council's Earth Sciences Decadal Survey; and $102 million for ocean science and research at NOAA, NSF and the U.S. Geological Survey in Interior.

Information technology is another major cross-cutting Federal program. The Networking and Information Technology R&D program—we call it NITRD—would receive $3.5 billion in this administration. That amount has doubled.

Another cross-cutting program, the National Nanotechnology Initiative, would receive more than $1.5 billion—on an international scale, one of the major contributors to this area of research.

At the agency level, National Science Foundation budget would increase by 14 percent to $6.8 billion, $822 million above the 2008 appropriation. The NSF physical sciences directorates, a priority for this administration, would increase about 20 percent.

The NIST core research and facilities budgets would receive $634 million in 2009, an increase of 22 percent over the 2008 omnibus provisions for these crucially important parts of the NIST portfolio. That includes increases of nearly $114 million for new initiatives at NIST in high-leverage areas such as nanotechnology manufacturing, expansion of NIST neutron facility for material studies, and improved understanding of complex biological systems to accelerate innovations and enable investment in the biosciences.

I have already mentioned new Earth observing programs at NASA. The NASA budget would increase by 3 percent over fiscal year 2008 to $17.6 billion. And, once again, this is a complex budget. I would be glad to discuss it further in response to your questions about NASA. But I do want to emphasize in my oral remarks that it is important to maintain NASA budget appropriations in order to avoid costly schedule delays in their large and multiple missions.

For NOAA, the 2009 budget provides $383 million for oceanic and atmospheric research and again requests $20 million for ocean science and research as part of a $40 million interagency effort to implement the Ocean Research Priorities Plan, which is part of the President's U.S. Ocean Action Plan.

Finally, my own office, Office of Science and Technology Policy—which, by the way, sustained a 6 percent reduction in fiscal year 2008 in the omnibus—is requesting $119,000 above the fiscal year 2008 appropriation but $215,000 below the fiscal year 2008 request on a budget of $5.3 million. This fiscal year takes us through the end of the current administration and the beginning of the next, and I believe the increased funding is important for this transition.

And I am also requesting that the Science and Technology Policy Institute—we call it STPI—continue to be funded within the NSF budget. I would be glad to explain why this is important.

So I thank you for this opportunity to highlight the President's 2009 budget proposal for science. I think it is a strong proposal, and I urge your support of it. And I would be glad to provide more detail. I know we will discuss these issues in the question-and-answer session.

I am happy to be here once again. Thank you for the opportunity to appear.

[The written statement of Dr. John Marburger, III, Director, Office of Science and Technology Policy follows:]

Statement of Dr. John Marburger, III
Director, Office of Science and Technology Policy
to the
Subcommittee on Commerce, Justice, Science and Related Agencies
Committee on Appropriations
United States House of Representatives
February 26, 2008

Chairman Mollohan, Ranking Member Frelinghuysen, and members of the Subcommittee, I am pleased to appear before you once again to present the President's Fiscal Year 2009 research and development (R&D) budget. In the eighth and final year of this Administration, today's hearing provides an opportunity to take stock of how far we have come, where we are today, and, most importantly, what remains to be done for U.S. science and technology.

Last year, the Administration asked this Subcommittee to fund the American Competitiveness Initiative (ACI). With initial House passage of the FY 2008 Commerce, Justice, Science and Related Agencies Appropriations Act you delivered that support. Your strong efforts on behalf of American innovation and competitiveness were formally recognized in the Statement of Administration Policy on that bill which read:

> *"The Administration commends the Committee's implementation of ACI with its strong support for the National Science Foundation (NSF) and the standards and research activities of the National Institute of Standards and Technology."*

Unfortunately this Subcommittee's good work was not ultimately realized in the 2008 Omnibus funding bill, but I urge you to maintain your commitment. I can assure you that this Administration remains firmly committed to the ACI, as attested by the President's words in last month's State of the Union address:

> *"To keep America competitive into the future, we must trust in the skill of our scientists and engineers and empower them to pursue the breakthroughs of tomorrow. Last year, Congress passed legislation supporting the American Competitiveness Initiative, but never followed through with the funding. This funding is essential to keeping our scientific edge. So I ask Congress to double federal support for critical basic research in the physical sciences and ensure America remains the most dynamic nation on Earth."*

Increased funding for critical basic research in the physical sciences is my highest budget priority. This Subcommittee has led by fully funding these basic research increases last year. We now must succeed in implementing ACI with actual funding. If we fail, it will significantly impair and delay all our efforts to strengthen long-term economic competitiveness through innovation-enabling basic research in the physical sciences and engineering. Lost research time delays innovations, slows development, misses market opportunities, and costs jobs and economic growth.

The basic research programs prioritized in the ACI and authorized in the America COMPETES Act remain in an under-funded state relative to their importance for the long term strength of our Nation's economy. The National Science Foundation, the Department of Energy's Office of Science, and the National Institute of Standards and Technology's core lab research and facilities provide basic research infrastructure for every field of science, and produce the new knowledge that make technology breakthroughs possible. This Subcommittee has a commendable history of bipartisan support for science funding, for effective advocacy of basic scientific research, and for its technical applications that benefit every part of our society. On behalf of the Administration, I thank the Subcommittee for the good working relationship it has established with the science agencies and with my office, and look forward to working together for robust funding of our mutual innovation and competitiveness agenda.

Overall, Federal R&D in the 2009 Budget is $147 billion, $4 billion more than FY 2008. That represents one out of every seven dollars requested by the President in the discretionary budget. This total exceeds the Fiscal Year 2001 amount by $56 billion and represents growth of 61 percent since then. Over these eight years, the cumulative Federal R&D investment will total over $1 trillion.

The growth in non-defense R&D is even more dramatic in the 2009 Budget. The President is seeking a six percent increase in this category. By comparison, the remainder of the non-security discretionary budget is up less than 1 percent. And I draw your attention to the chart of Federal non-defense spending over time (Attachment 1). With the 2009 Budget, real growth in outlays for the conduct of non-defense R&D, with the effect of inflation accounted for, is up 31 percent in eight years. Real non-defense R&D growth for the previous eight years was 11 percent. The President's commitment to the government's R&D enterprise is strong, and the advancement of science remains among his top budget priorities.

America COMPETES Act of 2007: This bipartisan Act authorized many existing and new programs which the President's Budget prioritizes in a straightforward way: The Administration has accepted the conclusions of many studies and reports that funding for ACI basic research is most important and needs to be addressed first. This prioritization reflects a broad endorsement by the business and academic communities (Attachment 2).

Prioritizing within the constraints of budget realities necessarily means that some of the programs and activities authorized in the America COMPETES Act could not be requested in this Budget. The lack of funding in the 2008 Omnibus funding bill for the priority basic research increases authorized in the America COMPETES Act makes it even more imperative to address these priorities in the forthcoming fiscal year.

Earmarks: Before summarizing this year's research budget, because research earmarks returned in the 2008 appropriations, I want to express my concern about the very serious impact earmarks have on the science budget.

In FY 2008, DoD basic and applied research earmarks total about $1.1 billion (about 1/6 of DoD research's total budget); $124 million of the DoE Office of Science is earmarked; and $83 million in earmarks and unrequested grants seriously dilute the core research and facilities proposed at the National Institute of Standards and Technology. Altogether, research earmarks are estimated at $2 billion of the $16.8 billion of overall appropriations earmarks government-wide in FY 2008. In nominal terms, this is more than the $1.8 billion increase in the overall FY 2008 Federal Science & Technology (FS&T) budget and earmarks therefore result in a real cut in merit-reviewed research at the agencies that are included in the FS&T budget. Sustained U.S. competitiveness depends on pursuing the best science. I hope the Congress will significantly reduce research earmarks in the FY 2009 appropriations process, as it did so commendably in fiscal year 2007. Congress has wisely not subjected NSF and the National Institutes of Health to earmarking, and it is now time to end this practice for all research programs.

Basic Research: Turning to overall Basic Research in the 2009 Budget, $29.3 billion is requested, an $850 million increase. If earmarks were abandoned, the real programmatic benefit would be even larger. I want to emphasize that this favorable treatment of Basic Research is occurring in a year of spending reductions for many other domestic programs, indicating the high priority this Administration places on the importance of this activity.

ACI: As described above, the centerpiece of the Administration's Basic Research agenda is the American Competitiveness Initiative. The 2009 Budget calls for a 15 percent or, $1.6 billion, increase for the ACI's three priority science agencies: the National Science Foundation; DoE's Office of Science; and the laboratories of the National Institute of Standards and Technology. This $12.2 billion of total funding is necessary to recover the momentum we lost by not funding these priority agencies last year (Attachment 3).

Complementing these increases, planned basic research at the Department of Defense will grow by $270 million over the FY 2008 request —a 19 percent increase, yielding a total of $1.7 billion— consistent with the President's commitment to support high value research in the physical sciences. These investments are made to support national security but, due to the broad effects of basic research, also contribute to ACI innovation goals.

Climate Science: While long term innovation and competitiveness are the priority drivers in the 2009 Federal R&D budget, other science areas remain important to National goals. Since FY 2001, the Administration will spend approximately $14.6 billion on climate change science research through the multi-agency Climate Change Science Program. The President's 2009 CCSP budget exceeds $2 billion, a 12 percent increase over FY 2008 enacted. The U.S. leads the world in advancing climate change policy and programs, with planned expenditures of nearly $9 billion in climate-related science, technology, international assistance, and tax incentive programs proposed in FY 2009 – much more than any other country and a nine percent increase over 2008 enacted levels.

Earth Observations and Ocean Initiative: In other programs relevant to the environment, the 2009 Budget includes increased funding for a number of Earth Observation programs, most notably $74 million for the National Oceanic and Atmospheric Administration (NOAA) to sustain the highest priority climate measurement capabilities that once were part of the National Polar-orbiting Operational Environmental Satellite System (NPOESS) program, and $103 million for NASA to embark on the new series of space-based Earth observing missions recommended by the National Research Council's recent Earth Sciences Decadal Survey. A new

National Land Imaging Program office to ensure long-term continuity of multi-spectral imaging of the Earth's surface is established in the U.S. Geological Survey (USGS). This year's Budget again includes the Administration's Ocean Initiative, which calls for $102 million for ocean science and research at NOAA, NSF and the USGS.

Information Technology: President Bush's FY 2009 Budget of $3.5 billion for Networking and Information Technology R&D (NITRD) represents a doubling since 2001. This brings the eight year total investment in this area to more than $20.9 billion. The 2009 Budget emphasizes the NITRD priorities of high-end computing R&D and infrastructure, advanced networking, and cyber security and information assurance. The tools and capabilities that result from the NITRD program affect every area of science and technology and enhance the Nation's competitiveness.

Nanotechnology: This Administration's National Nanotechnology Initiative (NNI) continues strong with over $1.5 billion in FY 2009 for this well-coordinated multi-agency, investment in fundamental research, multi-disciplinary centers of excellence, and development of focused cutting-edge research and education infrastructure. With the 2009 request, nearly $10 billion will have been invested in nanoscale R&D in seven years. The NNI includes important research on the societal implications of nanotechnology, including human and environmental health and methods for managing potential risks.

SUBCOMMITTEE AGENCY BUDGET HIGHLIGHTS

National Science Foundation (NSF):

Funds are requested to increase the budget for NSF to $6.85 billion in FY 2009, 14 percent or $822 million above 2008's $6.03 billion. As one of the three key agencies in the American Competitiveness Initiative, NSF is the primary source of support for university and academic research in the physical sciences, funding potentially transformative basic research in areas such as nanotechnology, advanced networking and information technology, physics, chemistry, material sciences, mathematics and engineering. The NSF physical sciences directorates receive increases of about 20 percent.

NSF is a primary lead for two previously mentioned Administration priority research areas that promise to strengthen the Nation's economy: the National Nanotechnology Initiative (NNI) and the Networking and Information Technology R&D program (NITRD). NSF-funded nanotechnology research, sustained at $397 million in FY 2009, a 165 percent increase since 2001, has advanced our understanding of materials at the molecular level and has provided insights into how innovative mechanisms and tools can be built atom by atom. This emerging field holds promise for a broad range of developing technologies, including higher-performance materials, more efficient manufacturing processes, higher-capacity computer storage, and microscopic biomedical instruments and mechanisms. NSF's investments in NITRD, funded at $1.1 billion in 2009, up $159 million over 2008 and 71 percent since 2001, support all major areas of basic information technology (IT) research. NSF also incorporates IT advances in its science and engineering applications, supports computing and networking infrastructure for research, and contributes to IT-related education for scientists, engineers, and the IT workforce.

NSF will continue to support the development of a petascale computing capability widely accessible to the science and engineering community. A new $20 million cross-Foundation investment that is part of both the NNI and NITRD, Science and Engineering Beyond Moore's Law, is a multi-disciplinary effort to advance the fundamental science and technology of semiconductor electronics.

The 2009 NSF Education and Human Resources (EHR) budget will continue efforts to prepare U.S. students for the science and engineering workforce with a nine percent overall increase (+$65 million) over the level in the 2008 Omnibus. Specifically, the 2009 EHR Budget provides a five percent increase for the Math and Science Partnerships program at NSF, and a seven percent increase for the Noyce Scholarship program. NSF-wide Graduate Research Fellowships are proposed for a 32 percent increase and will support an additional 700 graduate students.

NSF's investment in Cyber-enabled Discovery (CDI), begun in FY 2008, more than doubles for a total of $100 million in FY 2009. The CDI investment promotes the advancement of science and engineering along fundamentally new pathways opened by computational thinking.

NSF will continue to fund research on cybersecurity foundations, network security, and systems software that supports the objectives of the *Federal Plan for Cyber Security and Information Assurance Research and Development*. Emphasis will be placed on usability, privacy, and theoretical foundations.

National Institute of Standards and Technology (NIST):

The Department of Commerce's NIST "core" research and facilities receive $634 million in 2009, an increase of 22 percent over the 2008 Omnibus after accounting for earmarks and unrequested grants. In 2009, the American Competitiveness Initiative proposes NIST funding increases of nearly $114 million for new initiatives in research and measurements in high-leverage areas such as nanotechnology manufacturing; expanding NIST's neutron facility to aid in characterizing novel materials in high-growth research fields; and improving our understanding of complex biological systems to accelerate innovations and enable investment in biosciences, including disease diagnosis and treatment.

National Aeronautics and Space Administration (NASA):

The President's 2009 Budget for NASA is $17.6 billion, a three percent increase over FY 2008, reflecting a steady commitment by the Administration to the continued execution of the Vision for Space Exploration and to using the Shuttle to assemble the International Space Station until the Shuttle retires in 2010. Maintaining NASA budget appropriations is extremely important for the continued viability of its programs.

In 2009, NASA requests $3.5 billion in direct costs for exploration systems including the Orion Crew Exploration Vehicle (CEV) and the Ares I launch vehicle that will carry astronauts to the Moon. 2009 will see the Ares I-X test flight, the first test flight of the Ares I launch vehicle. Ares I-X will involve a first stage with a functional four segment solid rocket booster and an inactive fifth segment, and an upper stage mass simulator. Ares I-X will test first-stage flight dynamics, controllability, and separation of the first and upper stages. Having already initiated the acquisition process for certain elements of this architecture during 2006, NASA now has all Orion CEV and Ares I elements under contract with the first crewed-flight planned to occur in 2015.

The 2009 Budget requests $4.44 billion in direct costs to continue operating the nearly 60 spacecraft of NASA's Science Mission Directorate and to support investments in future Earth and space science missions, vital technologies, and frontier research. NASA will launch seven new Earth observing missions in the next several years, including projects such as the Landsat Data Continuity Mission and the Global Precipitation Measurement mission. In a significant new initiative, NASA also will embark upon a series of high-priority, space-based Earth observing missions, informed by the recommendations of the National Research Council's recent Decadal Survey on earth sciences. At the same time, NASA will continue its roles in the interagency Climate Change Science Program and the international initiative on the Global Earth Observing System of Systems. NASA will expand its program of scientific exploration of the Moon through a new series of low-cost robotic missions that will advance our knowledge of Earth's closest neighbor as we prepare for a human return to the Moon. Following up ongoing missions to Mars, Saturn and Mercury, NASA also will send ever-more-capable spacecraft to Mars and other outer planets. In addition, NASA will continue its vibrant astrophysics and astronomy efforts through programs such as Beyond Einstein and the Great Observatories, and will upgrade the Hubble Space Telescope in late 2008 to provide five more years of productive on-orbit life. NASA also will maintain its important heliophysics research through projects such as the Radiation Belt Storm Probes.

In December 2007, the President approved the Nation's first National Plan for Aeronautics R&D and Related Infrastructure. Consistent with this Plan, the 2009 NASA aeronautics budget prioritizes fundamental aeronautics research, the improvement of aviation safety, and research supporting the development of the Next Generation Air Transportation System. In addition, NASA will continue to address infrastructure upgrades and maintenance requirements for aeronautical test facilities across NASA centers that are of vital importance to the Nation. The 2009 budget requests $447 million for NASA aeronautics direct costs.

National Oceanic and Atmospheric Administration (NOAA):

For NOAA in the Department of Commerce, the 2009 Budget provides $383 million for Oceanic and Atmospheric Research (OAR), 22 percent more than in FY 2001. OAR provides for ongoing research on climate, weather, air quality, and ocean processes.

The FY 2009 NOAA budget again requests $20 million for oceans science and research (with another $20 million from NSF and USGS) as part of a $40 million interagency effort to implement the Ocean Research Priorities Plan called for in the President's U.S. Ocean Action Plan. Unfortunately, the 2008 Omnibus provided about 10 percent of the $40 million requested. Nevertheless, the President remains committed to enhancing ocean science that will make our oceans, coasts and Great Lakes cleaner, healthier and more productive and is again requesting new funding to support efforts in these areas. The $20 million will address the four near-term ocean research priorities established by the Ocean Research Priorities Plan and Implementation

Strategy, published in January 2007. The NOAA Budget also proposes $8 million to continue extended continental shelf scientific analysis to define and map its U.S. outer limits and $23 million to develop an operational ocean monitoring network.

Office of Science and Technology Policy (OSTP):

As you know, the Subcommittee also funds OSTP's own budget. After sustaining a six percent cut in FY 2008, we are requesting $5.3 million in the 2009 Budget. This amount is $119,000 above the FY 2008 appropriation, but $215,000 below the FY 2008 request. FY 2009 will take OSTP through the end of the current Administration and the beginning of the next Administration. Full funding of the OSTP request is important for both of these transition phases to proceed smoothly. The next Administration will undoubtedly propose an organization and funding level for OSTP to fulfill the agency's functions in FY10 and beyond. The current request reflects our desire to continue to fulfill OSTP's mission in a robust manner to the end of the current term, and to provide the new Administration with flexibility to bring OSTP rapidly to an effective level of operation.

OSTP also seeks full funding for the Science and Technology Policy Institute (STPI) within NSF's request. STPI is a congressionally-chartered Federally Funded Research and Development Center that provides excellent objective, technical support to OSTP and other agencies. Because the congressional statute mandates that NSF sponsor STPI, OSTP requests that this amount be fully funded within the NSF budget in support of OSTP's mission. We have included such language in the OSTP budget narrative in response to the 2008 Omnibus report language that directed OSTP to request this funding.

CONCLUSION

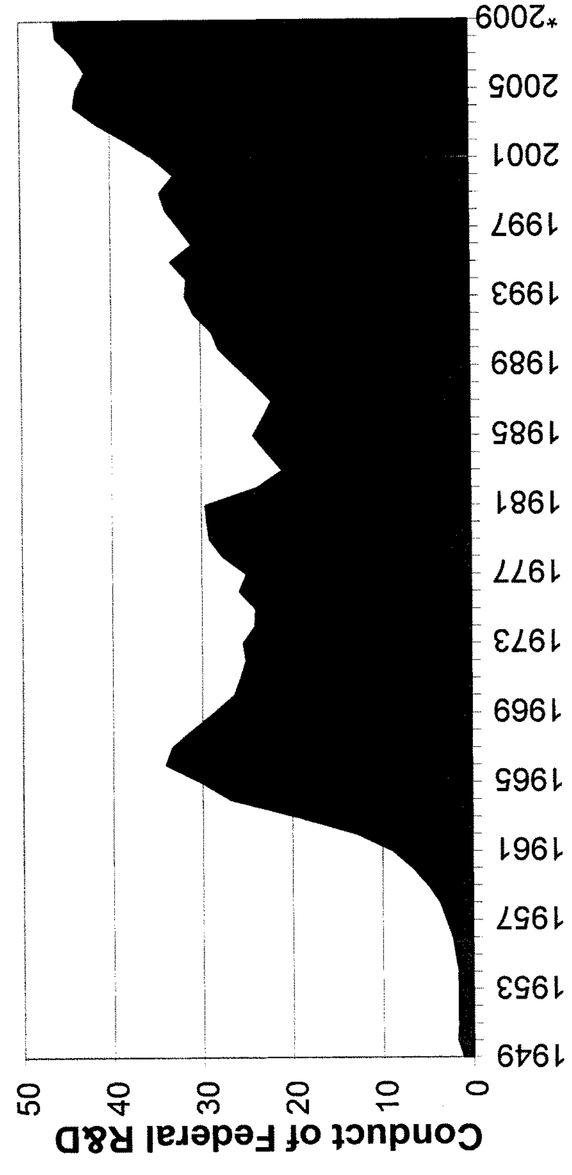
Making choices is difficult even when budgets are generous, but tight budgets require focused priorities and strong program management. This year's R&D budget proposal provides robust levels of investment that allow America to maintain its leadership position in science and move ahead in selected priority areas. The ACI properly focuses R&D investments in areas that will increase our economic competitiveness.

America leads all nations in research and development expenditures. In 2006, U.S. R&D investment at $340 billion exceeded that of all the other G7 nations combined. After a worldwide slowing in R&D expenditures in the early 1990's, R&D spending rebounded in the late 90's, with the United States experiencing the most robust growth. Our scientists collectively have the best laboratories in the world, the most extensive infrastructure supporting research, the greatest opportunities to pursue novel lines of investigation, and the most freedom to turn their discoveries into profitable ventures if they are inclined to do so. Combined with the merit review process that has ensured the quality of American science in the past half century, these factors make American science the strongest in the world.

This budget will sustain this leadership and maintain science and technology capabilities that are the envy of the world. I ask that Congress fully fund the R&D initiatives advanced in the President's 2009 Budget.

I would be pleased to respond to questions.

Attachment 1



Federal Non-Defense R&D Spending
(Outlays in billions, constant 2000 dollars)

*President's 2009 Budget

Attachment 2

American Innovation Proclamation

We, the leaders of American business and higher education, call on Congress to act quickly on an innovation agenda that will ensure continued U.S. competitiveness, enabling Americans to succeed in the global economy.

Innovation leadership creates high-wage jobs and rising incomes for Americans. Innovation drives productivity and economic growth, giving American workers the tools to remain the most productive in the world and creating products, processes—and even new industries—that expand employment and boost living standards.

The United States has remained the world's innovation leader through a commitment to basic research, a world-class workforce and a climate that rewards innovation. But America cannot rest on past economic success. Our competitors are investing in innovation, improving their competitive position and, in some respects, surpassing us.

Therefore, Congress must act to:

Renew America's commitment to discovery

by doubling the basic research budgets at the National Science Foundation, the National Institute of Standards and Technology, the Department of Energy's Office of Science and the Department of Defense;

Improve student achievement in math and science

through increased funding of proven programs and incentives for science and math teacher recruitment and professional development;

Welcome highly educated foreign professionals,

particularly those holding advanced science, technology, engineering, or mathematics degrees, especially from U.S. universities, by reforming U.S. visa policies;

Make permanent a strengthened R&D Tax Credit

to encourage continued private-sector innovation investment.

We, the signatories, hereby proclaim our support for these initiatives and stand ready to do our part.

Craig R Barrett

Craig Barrett
Chairman
Intel Corporation

Richard K. Templeton
President & CEO
Texas Instruments

Carl F. Kohrt
President & CEO
Battelle

Arthur F. Ryan
Chairman & CEO
Prudential Financial, Inc.

Harold McGraw III
Chairman, President & CEO
The McGraw-Hill Companies, Inc

Norman R. Augustine

Norman R. Augustine
Former Chairman & CEO
Lockheed Martin Corporation

Charles O. Holliday, Jr.
Chairman & CEO
DuPont

Nicholas M. Donofrio
Executive Vice President,
Innovation & Technology
IBM Corporation

Robert C. Dynes
President, University of California

Additional Signatories on the Back.

Attachment 3

President Bush's ACI Research Commitment

(in millions of dollars)

ACI Basic Research Agencies	FY 2006 Funding	President's FY 2007 Request	FY 2007 Funding	President's FY 2008 Request	FY 2008 Omnibus	President's FY 2009 Budget	FY 2009 Budget Above FY 2008 Omnibus
NSF	**5,582**	**6,020**	**5,917**	**6,429**	6,032	**6,854**	+822
DoE Office of Science	**3,596**[2]	**4,102**	**3,797**	**4,398**	3,973[5]	**4,722**	+749[8]
NIST Core[1]	**568**[3]	**535**	**493**	**594**	605[6]	**634**	+29[9]
ACI Total	9,747[4]	10,657	10,207	11,421	10,610[7]	**12,210**	+1,600[10]

[1] NIST Core consists of NIST lab research and construction accounts
[2] Includes $135 million in earmarks
[3] Includes $137 million in earmarks
[4] Includes $272 million in earmarks
[5] Includes $124 million in earmarks
[6] Includes $83 million in earmarks and unrequested grants
[7] Includes $207 million in earmarks and unrequested grants
[8] +$873 million after accounting for earmarks.
[9] +$112 million after accounting for earmarks and unrequested grants
[10] +$1,807 million after accounting for earmarks and unrequested grants

Mr. MOLLOHAN. Thank you, Dr. Marburger.

BUDGET PREPARATION

Dr. Marburger, you serve as the science advisor to the President and as the director of the Office of Science and Technology Policy. In those roles, you provide counsel to the President and to his executive offices on the impact of science. You coordinate science among the agencies and the interagency effort to develop sound, balanced budgets in research and technology.

Describe for the committee, how you discharge those responsibilities, and particularly as they relate to the development of the annual budget estimates that the President sends to the Congress. What is the interaction with the agencies and with OMB?

Mr. MARBURGER. Congressman, the process begins early in the year with requests to the chief scientists in the various agencies for recommendations for priorities for the subsequent year. And it continues with a priorities memo that I sign jointly with the Director of OMB, which outlines the priorities that will be paid attention to in the budget process for the ensuing fiscal year.

And the agencies prepare their budget proposals, which are submitted to OMB, during the early and mid parts of each year. And as those budget proposals come in from each agency, my office works with OMB to review the proposals that the agencies are making, see to it that they do reflect the plans that have been worked out jointly among the agencies on who will do what and what the priorities are. And then, subsequently, we participate in the presentations that the budget examiners make to the budget director and advise on priorities in that forum.

The ultimate choices about the actual amounts that the President will request are made, of course, by the President in consultation with the budget director and his Cabinet officers. And our primary role in that is simply to advise on the quality of the proposals and their relevance to the priorities that have been established.

Mr. MOLLOHAN. Do you review those budgets before they are sent to OMB?

Mr. MARBURGER. We do not review them before they are sent to OMB, no. We see them at about the same time that the OMB staff does. The OMB staff receives them and shares them with us. Sometimes the agencies share the budgets with us. But it is——

Mr. MOLLOHAN. Before they go to OMB?

Mr. MARBURGER. No, at the same time.

Mr. MOLLOHAN. You receive the budget requests from the agencies under your jurisdiction at the same time they are sent to OMB?

Mr. MARBURGER. That is correct. And I think we probably both receive them at pretty much the time that they are completed and ready to submit.

Mr. MOLLOHAN. Excuse me for interrupting. Do you recommend to the agencies, while they are working up their budgets? Do you give direction to them in any way? Is there any interaction?

Mr. MARBURGER. We do continually interact with the agencies, some more than others. The agencies that we interact with tend to be the ones that have larger science budgets and that have budgets that cross agency boundaries.

For example, we would probably give considerably less direction, if you wish—it is not so much direction as advice and working with them on their priorities—we probably give less to agencies like the National Institutes of Health, which more or less owns biomedical research, and on issues that are totally within an agency's purview. Energy research is another example.

Mr. MOLLOHAN. Well, at what point in the process are the administration's priorities imported to the agencies, so that when agencies come forward to you and OMB at the same time they reflect the administration's priorities?

Mr. MARBURGER. I would say the strongest feedback on administration priorities comes within the context of the budget preparation. Although, we do let the agencies know the general priorities in that priorities memo that we produce about in mid-year or spring of each year.

But the most direct feedback does come in the budget process, where the agencies are negotiating with the Office of Management and Budget regarding the amounts and what they will be spent on, because those agreements will be reflected in the document that you receive from the President.

Mr. MOLLOHAN. Right. But in that process, it seems logical that you would be inputting at some point, if not at a budget level, at a policy level, what you want these agencies to concentrate on. For example, "We want you to fund MEP," or, "We consider TIP—" or something else that is to be a priority or to highlight something that is in the COMPETES Act.

In other words, how does that policy interaction occur?

Mr. MARBURGER. We actually work with the agencies all year, during the course of the year. We convene them in interagency working groups to develop strategic plans and so forth.

And, you know, unlike other areas of Federal operations, science, particularly the research part of the R&D budget, is something that comes from the scientists. We don't attempt to dictate what the best course of action is in a research program. We tend to follow the recommendations from the agencies, from their advisory groups, and particularly from the National Academies of Sciences, and from the reports that are prepared by the President's Council of Advisors on Science and Technology. And we try to assimilate that material and find out what the science community and the people who rely on the science community for their technologies, what they want and what they think is most important. And so, it is not exactly a top-down process.

There are some raw principles that the administration espouses. The administration does believe that basic research is the most important research activity for the Federal Government to fund, and applied, shorter-term, lower-risk research is the proper province of——

Mr. MOLLOHAN. Do you carry out that priority in this interaction that occurs during the year?

Mr. MARBURGER. Yes.

Mr. MOLLOHAN. Do you give direction to the agencies?

Mr. MARBURGER. We let agencies know that that is what the priority is. But most of them seem to sense that without us telling them.

RESEARCH GOALS

Mr. MOLLOHAN. When you came to the job, did you have any personal goals about where the country should go with regard to basic or applied research?

Mr. MARBURGER. Yes, I did.

Mr. MOLLOHAN. What were those?

Mr. MARBURGER. Well, my personal goals were to achieve a good, balanced portfolio for the Nation. I did believe, coming into this job, that basic research was a very important driver for the country, that it's not very well understood by the public and what its role is, but that it needed to be sustained and supported in a variety of areas in order to feed everything else.

I do believe that technology draws upon the physical, biological phenomena, the natural phenomena that research investigates and clarifies, and that we have a, sort of, hierarchy of activities that have to be carried out, extending from basic research, primarily supported by the Federal Government, through applied research and development and on to industrial research and applications and innovation.

And I came into the job with kind of a vision, a picture, of how that should work. And that picture is formed by being a scientist myself, being the director of a national laboratory, president of a research university. I saw it work. And I read the literature, I read the reporters of the National Academies, which I highly respect, and experienced imbalances in the budget that I thought were hampering our ability to compete internationally.

I came to the job believing that it was important to increase funding for basic research in the physical sciences, in certain key areas. And I still believe that that is an urgent necessity for the country.

And, otherwise, my intention was to try to make science work for the Nation. And I still believe that science is an important tool for us that we need to use in this globalization of our economy and world competitiveness.

Mr. MOLLOHAN. If you are comfortable, would you share with the Committee what you think we, as a country, are doing right and where we might not be doing as well, as reflected in the President's budget or in whatever terms. This is just an opportunity for you to address what we can do better. If you don't feel comfortable answering——

Mr. MARBURGER. I understand. No, I do feel comfortable with that, because I think we are very lucky in America. We do have huge investment in science. We really are doing very well. We are the envy of other nations, all of whom are trying to copy our models, and that puts a great deal of pressure on us to get it right.

I think that we do have a need to have steady, more or less reliable funding. I think, speaking as someone who has managed research as a high level for much of my life, it is almost more important to have stability and predictability in Federal funding in research and programs than it is to have a lot of money. Although, a lot of money is desirable.

So I think we do a lot right. We do have substantial Federal programs. We do listen to the science community. The agencies do a good job of that.

Mr. MOLLOHAN. The important word I had in my question was "specifically"—"specificity." Because, at the end of the day, we have to end up putting dollars on accounts. Can you talk about it in those terms?

INVESTMENTS IN SCIENCE PROGRAMS

Mr. MARBURGER. Well, I will tell you one very specific thing: I think the NIST research budget is the most underfunded budget, if not in the world, at least in the country. NIST is a hugely productive and high-leverage operation. And I am speaking particularly of the research that they do into basic physical phenomena that underlie most of our products, including biomedical products, software, hardware, just about anything that you can name. NIST is a focused, well-managed agency that ought to be about four times bigger than it is, in my humble opinion. And, although it is a small agency, that is why it features in the President's American Competitive Initiative, and that priority has been embraced in the America COMPETES Act and by others.

So I would start with NIST. If I had to put my money where my mouth is, I would start with NIST, their basic research budget. They have had three Nobel prizes in the last decade, and they know what to do. And I would be very proud of that. I have never worked for NIST. I don't have any stake in it, other than I think it is important.

Second would be the infrastructure for science, the big facilities that are operated by a number of agencies, including NSF and Department of Energy, both in NNSA and the Office of Science. And NIST operates a research reactor. The Department of Defense operates some important facilities.

Mr. MOLLOHAN. NIST operates a research——

Mr. MARBURGER. Yes, NIST operates probably the most sophisticated research reactor in the United States.

Mr. MOLLOHAN. I didn't mean to interrupt you.

Mr. MARBURGER. And that is used for material studies, improvement of various materials such as fuel cell membranes and things like that.

So, similar facilities in other agencies that provide platforms for thousands, tens of thousands, of users in industry and universities, we need to make sure those platforms are there and available.

And that is one of the reasons why the Department of Energy's Office of Science was featured as a priority, because it operates, for example, the X-ray synchrotron facilities that are used to unravel the structure of biomedical molecules. All of these nice pictures that you see on the covers of magazines that show intricate molecules, they look like tangles of yarn—those structures are determined on the Department of Energy's Office of Science's machines.

The Spallation Neutron Source has just been completed in Oak Ridge. That is another example of an infrastructure platform that—we need to sustain these. Other countries have discovered that they are important for their future economic competitiveness.

They are building them at a great rate, and we need to make sure that we catch up on those.

And then the important university-based research that is traditionally funded by the National Science Foundation, NIH. The Department of Defense is a very important funder of basic research and engineering. That needs to be sustained.

Mr. MOLLOHAN. But quantify that for us a little bit. I mean, give us an idea of how you think we are doing with that.

Mr. MARBURGER. In these areas, there is an imbalance, in my opinion, between our relatively healthy funding for biomedical research and the other areas of research. Particularly in certain areas of the physical sciences, there has been an imbalance in funding.

Now, I don't mean to suggest that NIH is getting too much money.

Mr. MOLLOHAN. No.

Mr. MARBURGER. They also need to have stability and predictability in their budgets.

Mr. MOLLOHAN. Right.

Mr. MARBURGER. But we have an imbalance here.

Even the biomedical sciences depend on the physical science infrastructure and continued research in these areas. And so one of the things that the COMPETES Act, as well as the ACI, does is try to prioritize a little bit and, during the next some portion of a decade, try to redress that imbalance.

It is hard for me to say just how much money is required, because it is more important for us to get the balance right. We invest, as a Nation, much more money than anybody else in the world does, including the European Union and Asia and so forth. They are catching up. They will be investing comparable amounts, and already in some areas they are. But I am not so much worried about the absolute amount of money that we have; it is how it is distributed and how we manage it.

Mr. MOLLOHAN. Thank you.

I have terribly overstepped my time and apologize to Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Well, thank you, Chairman. I hope you will let me violate your rule.

Mr. MOLLOHAN. I will. I will.

Mr. FRELINGHUYSEN. Let me again——

Mr. MOLLOHAN. It is really good testimony.

COMPETITIVENESS

Mr. FRELINGHUYSEN. It is excellent. No, I think this whole issue of imbalance is important.

And, quite honestly, we respect what you call your humble opinion. You are at the top of the heap, in terms of the leadership hierarchy. You are the President's science advisor. So you don't need to be humble about your opinion. That is why you're here. And we thank you for a very long and distinguished career.

We became first acquainted when I visited all the Department of Energy labs, and you greeted me out in Brookhaven. And I think I have visited just about every one. And they are somewhat, at times, crying the blues in terms of their basic research.

But, by definition, you are, sort of, the chief cheerleader for the American Competitiveness Initiative. I mean, it is you, perhaps the National Science Board and a lot of other groups with many different acronyms that, sort of, have oversight here.

And we talked about it indirectly, you know, pointing to the National Institutes of Health, it has almost been like a favored nation, NIH. We don't take anything away from them. But both Republicans and Democrats have been able to say, over the last couple of years, that we doubled NIH funding and we took pride in that.

We are talking, in some ways, the same language relative to this administration's investments in science, although we have fallen pretty short of the mark for reasons I have mentioned and you have mentioned. It is more than dollars. How do you judge what are really concrete and specific results?

And then I want to get into the issue here, too, and if we have—how do we measure what we anticipate from these programs, the imbalance issue? And then where we stand, let's say, next to People's Republic of China; growing capacity and activity in parts of India. I mean, when we talk about competitiveness, there may be some internal, domestic competitiveness. It is more than just competing with Europe.

How would you characterize where we are relative to—you know, dollars are one thing, but how we actually measure competitiveness?

Mr. MARBURGER. Well, I will try not to take too long in my answers. Those are big questions.

This administration is very interested in the process of measurement and assessment and understanding what works and what doesn't so you can invest wisely. And from the earliest days of my tenure in this position, my office has worked with OMB to craft some ways of making sure that science programs—which are notoriously difficult to assess, because usually they have long-term benefits, and you can't just wait for many years to find out how something works. But, together, we have crafted assessment tools and the process of measuring and evaluating science programs and agencies.

And each year in our budget request, the science chapter does include a section on how we do this. If you go to the President's budget proposal for this current year, you will see in there a description of the evaluation process.

Economists have studied the impact of basic research on competitiveness and economic growth over the years and give some overall figures on how we are doing. And they always indicate that there is a very high rate of return on Federal investments in research.

As to how we are doing with competing with other countries, we still are leading. We are still very competitive, according to national polls and surveys, particularly according to the OECD data. We continue to be a leader in competitiveness. And I think that the openness of our society and the encouragement of entrepreneurial behavior are real assets that will sustain us in the future.

But other nations, the rest of the world, are investing heavily in infrastructure that is pretty clearly designed to feed their innovative capacity. Certainly, Europe is getting its act together. It is beginning to fund basic research on a Europe-wide basis that uses

American models, peer review and planning and deliberate investments of their money. Asia also is making focused investments in areas of science, particularly physical sciences, where they expect to be able to innovate in the future and compete with us in areas like information technology.

CHINESE ECONOMY

Mr. FRELINGHUYSEN. As you are aware, the Chinese economy has been growing at, like, 10 or 12 percent each year. I assume that productivity is fueled by their scientific research and innovation. Are we measuring that? Look where we are.

Mr. MARBURGER. It is not clear to what extent innovation and science-based programs are responsible for the great rate of growth of the Chinese economy, but certainly they expect it to be important in the future and they are investing heavily in it. They still have a long way to go, and it is not clear just how their approach to planning their economy will work out in the long run.

The U.S. has to have confidence that we have the right approach, and not lose faith in the ability of the basic research and technology development that we do so well.

MATH AND SCIENCE EDUCATION

Mr. FRELINGHUYSEN. There are many spokes on the wheel here, and I just want to concentrate on one for a minute, relative to math and science education. The work of the National Mathematics Advisory Panel, established by the President by Executive order in April of 2006. It was created to advise the President and the Department of Education on the conduct, evaluation and effective use of the results of high-quality research pertaining to the effective teaching of and learning of mathematics.

The group has met 11 times, reviewed over 16,000 studies and scientific documents, received public comments. Its recommendations are, I think, to be issued momentarily. Would you like to give us a little bit of a preview, from what you know?

I mean, you know, one of the things I tell my constituents—and they get quite irritated, especially when I visit schools—they only go to school for 180 days a year. I am not sure what their Japanese and Chinese equivalents do.

But, you know, what would be some of the findings that you would suspect that they would be recommending?

Mr. MARBURGER. I can't speak specifically to the findings in that report. I do know that it is modeled on the highly successful similar panel for reading. And controversies over best practices in how to teach reading were actually settled through the efforts of that panel, and I expect that similar controversies over the teaching of mathematics will be settled in connection with the report of the National Math Panel. That appears to be a successful operation.

I have a lot of opinions myself, having talked mathematical topics, mathematical physics in my day. And I do believe that it is important for us to pay attention to how math is taught, from kindergarden all the way up through college, and that some of the programs that are authorized and have been funded in connection with mathematics and science education will certainly take us closer to ideals.

GATHERING STORM

Mr. FRELINGHUYSEN. When I see you here, I think of Norman Augustine, Rising Above the Gathering Storm. And, you know, I hate the whole notion—I think all of us do—of recommendations sitting on the shelf somewhere. But one of those recommendations, obviously, is to take a look at what we are doing in a variety of areas.

Mr. MARBURGER. There are some successes. It is hard to identify exactly what the reasons are. Everyone is concerned about the teaching of mathematics. We need more math teachers. We need more math teachers who are qualified in mathematics and not just doing it grudgingly as an assignment because the schools couldn't find somebody else to do it. And one of the objectives of the American Competitiveness Initiative is, in fact, to increase the number of qualified teachers in these subjects.

But my understanding is that test scores in some grade levels have gone up over the past 5 years and that, although the results are sometimes difficult to interpret, the U.S. is making some progress in how——

Mr. FRELINGHUYSEN. Would you say—I don't want to take words out of context—the imbalances of which the Chairman—you were reacting to—it is not only financial, you know, the imbalances. It could be that we are, you know, maybe doing—we should be doing some other things.

Mr. MARBURGER. Yes. These education issues are multi-dimensional. And they depend on having good teachers. They depend on having parents that are aware of the opportunities for their children and doors that might be closed by not taking certain subjects. They are affected by the system of rewards that society offers for teaching positions. They are affected by the ability of local governments to fund adequate facilities for schools. There are so many different things.

I think we have to address these both with broad measures like No Child Left Behind, accountability approaches, and also with sharper measures like giving teachers tools, such as the national math advisory and reading panels would give. And all of these things have to be done at once. It is not clear which one of them is going to have the greatest effect. But, from my perspective, I am the science advisor, I am interested in using good information.

Mr. FRELINGHUYSEN. You want things to move ahead.

Mr. MARBURGER. I want things to move ahead.

INTERNATIONAL COMPARISON

Mr. FRELINGHUYSEN. Simultaneously. And, obviously, there are some areas there where we have shown some weakness compared perhaps to our international competitors.

Mr. MARBURGER. Yes. The international comparison tests show Americans not anywhere near the front of the pack.

Mr. FRELINGHUYSEN. It is discouraging, deplorable, so much so that sometimes people don't want to talk about it. But you are in a critical position, and we are counting on your humble opinion. We value that opinion.

Mr. MARBURGER. My humble opinion is that this is an important thing for us to do and that we need to continue to invest in the kinds of——

OMB

Mr. FRELINGHUYSEN. And the last comment here is, we have our own view of the Office of Management and Budget; it doesn't matter which administration it is. We want you to press on. And, you know, this committee believes that basic research in science and science education is important. We don't want you to bend too much.

Mr. MARBURGER. I am grateful for your support.

Mr. FRELINGHUYSEN. Thank you.

Thank you, Mr. Chairman.

Mr. MARBURGER. It helps.

Mr. MOLLOHAN. Thank you, Mr. Frelinghuysen.

Dutch Ruppersberger joins us this morning. He has a busier hearing schedule than anybody I know in Congress. And he told me a couple of weeks ago that he wasn't going to be here for a couple of months, because he was having a very serious operation. So I am shocked to see him here this morning in one way, but I am not shocked on the other, because, as busy as he is, he is more faithful than anybody in attending the hearings.

Dutch, it is great to see you. And I am glad you are——

Mr. RUPPERSBERGER. Thank you, Mr. Chairman.

Mr. MOLLOHAN [continuing]. I hope, recovering.

Mr. RUPPERSBERGER. I had spinal fusion. Thank goodness for the research and discovery, so they are able to fix your backs when you get to be a little bit older.

Mr. MOLLOHAN. Yeah, well, there you go. Welcome.

RESEARCH AND DEVELOPMENT

Mr. RUPPERSBERGER. Thank you.

Well, first, thank you for your testimony. What we do in research and development is so important to our country.

One of my first questions is this: it is my understanding that we in the United States spend more money for research and development than probably all the other G–7 countries combined. Is that correct?

Mr. MARBURGER. I believe that is correct.

Mr. RUPPERSBERGER. Do you know how we relate in the amount we spend in research and development compared to China and Russia?

Mr. MARBURGER. I can't give you those numbers off the top of my head, but we spend substantially more overall in science R&D, both in the research part and in the development part, than China does.

SATELLITES

Mr. RUPPERSBERGER. The Chairman talked about my schedule. We all have heavy schedules. I am also on the Intelligence Committee, and I chair the Research and Development Subcommittee. And we are now focusing on our satellites. We have had a lot of failures in our satellite industry. Years ago, when Sputnik was launched from Russia, we responded, as Americans, by within 12 years of putting a man on the moon. And one of the main reasons that we are the most powerful country in the world is because we do control the skies. And we must maintain that advantage. And, as you know, China and Russia are getting very close to us in that regard.

We have brought in all of the major contractors, and we are working a tabletop exercise and looking at our space industry with the DNI, Director of National Intelligence. And one of the things that has developed is that we are doing a lot of our research and development with our operations. In other words, we put out contracts to major contractors, and once they have these—I am not going to give you the costs, but they are very expensive contracts to build our aerospace industry—contracts they are doing the research and development as they are building the satellites, which I think is very dangerous.

Because when you start the actual manufacturing of the satellites, there should not be any room for error. And there have been numerous errors. The research and development must take place before you actually put the contract out for the operation.

Do you have any opinion on that position?

And I know that you do not do defense; you are non-defense. But it is still very relevant to a lot of the areas that you work in, as far as research and development.

In other words, my question: doing the research and development, having the failures, doing what you need to do before we actually get to the manufacturing mode?

Mr. MARBURGER. Yes, sir. Well, in fact, we do have a great interest in the defense research budget. And I agree with the analysis that you just suggested about the need for the research and development to be done before large amounts of money are spend on production or even pilots.

This is one of the reasons why we—in the materials associated with the President's American Competitiveness Initiative, although we didn't target the Department of Defense science budget for doubling over 10 years, we did indicate that it was important for them to increase their basic science research. That is one of the reasons that, in this year's budget request, the President is asking for a 19 percent increase in basic research in the Department of Defense.

One of the things that the Department of Defense needs to do is develop their in-house basic research capability, so that they can clear away some of the questions that are needed to resolve issues across the board in many more-advanced development projects. And I believe that they are headed in that direction.

Certainly the research capacity of the Department of Defense is important for maintaining the ability to evaluate contracts or readiness of programs to move forward. And I believe that it is important for them to sustain that ability.

DARPA

Mr. RUPPERSBERGER. How did you see DARPA, with the role that they play? Which I believe, personally, is a very positive role, is their research and development.

Mr. MARBURGER. DARPA is an excellent organization. They have a great history, and I believe that the current leadership of that organization is attempting to follow that history, of taking risks, funding early-stage research and development of concepts that may eventually pay off——

Mr. RUPPERSBERGER. Are you familiar with IARPA?

Mr. MARBURGER. I am.

Mr. RUPPERSBERGER. And IARPA is really DARPA, only in the intelligence community. I think there is a strong belief that, because of the competition not only in the area of terrorism but Russia and China and our overhead architecture, that the intelligence committee needs a DARPA. And DARPA has just been stood up last year. Do you have an opinion on IARPA?

Mr. MARBURGER. Well, you know, these are all——

Mr. RUPPERSBERGER. Research and development, out of the box.

Mr. MARBURGER. Right. Well, in my mind, it is more the nature of the research that is funded and the quality of the management of it. The structural niceties, like having a DARPA separate from the service organizations or having a central research organization that isn't committed to any particular one of the services, those are good ideas that could be captured in other kinds of management arrangements.

DARPA was created, was successful and is used as a model in other agencies. But I believe that research programs, such as those in National Science Foundation or NASA or elsewhere, can be successful without that specific type of organization.

So when it comes to evaluating a DARPA or IARPA, it really boils down to the leadership and the management, the people you have in place, the traditions that they have established to manage their research.

So I think it is too early to assess the success of IARPA. But it is there, and it is an idea that is modeled on other successes. And we have to wait to see how it does.

ITAR

Mr. RUPPERSBERGER. Let me ask you, are you familiar with the International Traffic in Arms—ITAR it is called?

Mr. MARBURGER. As much as I can be, with such a complex issue. I am not an expert.

Mr. RUPPERSBERGER. Basically I think, just to bring it down, that ITAR limits the sales of high-tech items to foreign countries.

Mr. MARBURGER. Yes.

Mr. RUPPERSBERGER. That is the purpose of ITAR.

And another thing that we have seen and has been developing is that ITAR efforts seem not to be working in other countries. In other words, we are doing this to protect our sale of all of our high-tech so that other countries wouldn't take our high-tech, and yet it seems now that, especially in Europe but in other places too, that a lot of the European contractors are offering ITAR-type free satellite development. And it has been said, again, getting back into the satellite area, that in the commercial area especially, that the United States is almost 10 years behind Europe in the development of what needs to be done from commercial satellites.

So I am asking you, it seems on its face to be pro-American not to give away our high-tech, and yet other countries now, most of the European countries, are now taking their research and development, and they are using it, and it is now putting us in a position that could hurt us. Do you see that? Do you hear that?

Mr. MARBURGER. Yes, I am aware of those analyses. I am concerned about the impact of ITAR on the ability of American firms and research organizations, including universities, to do work to advance the interests of our national security. So I think it is very important for us to watch ITAR and to evaluate it continually and update it and make it more effective.

I think it is in our national interest to have a program, something like ITAR, to make sure that we don't inadvertently give our potential adversaries, whether they are economic or military, advantage by using our own assets against us. So there is a need for a program, but it has to be done very carefully to avoid the kind of undesirable side effects that you refer to.

Mr. RUPPERSBERGER. It seems like we have the technology today to protect our high-tech. That is what the intelligence community is about, the classifications and people that have clearances.

But what would you recommend, to try to look at some of the complaints that we are receiving now about how ITAR is now putting us, the United States, and our major contractors at a disadvantage compared to a lot of the European countries and also China?

Mr. MARBURGER. It requires a review. As I recall that, I have to be careful answering this question because my memory is failing me about recent administrative actions on this. But we are concerned, and I am not the only one who is concerned about these impacts, and the administration has activities ongoing to evaluate and review ITAR. The Commerce Department has been quite involved in these efforts and is interested in doing it right.

So we do participate with this. My office convenes interagency discussions about what should be done, and I might say something that is incorrect if I just——

Mr. RUPPERSBERGER. If you come to some conclusions on how you think you could make it better, if you could have your staff contact my office or contact this committee and get that information.

Mr. MARBURGER. What I would do is tell you what is going on right now, and that would be our response to that.

Mr. RUPPERSBERGER. Mr. Chairman, I have one quick question.

Mr. MOLLOHAN. Sure.

JAMES WEBB SPACE TELESCOPE

Mr. RUPPERSBERGER. As you know, NASA is funding the James Webb Space Telescope, and it is very important, I think, to our country. And it is the at-large infrared optimized space telescope scheduled to launch 2013. And I notice you did not mention it in your statement or for the record. Is this considered an R&D activity?

Mr. MARBURGER. Yes. The Webb telescope is considered an R&D activity. It is a very important telescope, it has received high marks in all the reviews done by the National Academies and other advisory bodies. And although it has had cost overruns and schedule slips, there remains a commitment to it to get this done.

Mr. RUPPERSBERGER. Thank you for your testimony.

Mr. MOLLOHAN. Thank you.

BUDGET REQUEST FOR MEP AND TIP

Doctor, you indicated earlier the importance of NIST funding. Within NIST, there are two programs that were authorized in the COMPETES program: MEP, the Manufacturing Extension Program and the TIP program, the ATP follow-on. The administration's budget zeroes out those two programs. And based upon your thoughts expressed earlier, perhaps that was just a prioritization of funding and not a reflection by the administration necessarily or you particularly that those two programs weren't valuable, but other programs in this were valuable.

I want to give you an opportunity to talk about MEP and TIP and their importance, and why the administration chose to zero those programs out, because they have a lot of support here on the Hill, and so you are up against that. I suspect you are not looking at it in terms of being up against those programs or against those programs. My sense is there is just a funding and allocation issue here.

Mr. MARBURGER. Yes. The short answer is it is a prioritization issue. I will say that I feel very strongly that the basic research part of NIST, their core operations are the most important things, and that they are underfunded. I want to be clear about that. The what I would call, "technology transfer operations" have been much improved. The ATP program, I know, was developed in cooperation with Congress and with NIST to try to address some concerns that had been expressed, which I will mention a minute, about these types of programs. And I don't want to suggest that these are bad programs or that they are failing or that they are poorly managed, but only that in the grand scheme of things, if we have money that we can spend on NIST, I would like to see NIST grow its much more high-leverage operations first and let these others sort of rest until we can get the core up. So that is my personal opinion.

Let me say about the technology transfer programs, there is clearly differences among administrations and various sectors of commentators about these types of programs. Many people feel that—well, it is very clear that the Federal Government should be supporting basic long-term, high-risk basic research, and the private sector should be supporting very short-term development activities. There is a grey area in the middle, and there is a lot of room for disagreement about the priority of programs in that grey area.

This administration believes that the private sector should be investing in the types of activities that the MEP and the ATP program historically had been funding. So I want to acknowledge that the difference of opinion about the appropriate work to be done in private versus public sector does exist and does influence the decision about how to fund them.

That said, the primary reason that these activities in NIST are not funded in the current requests is prioritization. I certainly understand the interest of Congress in doing these, and I regret that we can't just fund everything under the constraints that have been established for this budget.

MEP OUTCOMES

Mr. MOLLOHAN. We have very impressive statistics that NIST itself reports regarding the MEP program per se. NIST reported the results of a survey of manufacturers that used the MEP program in 2006. One year after using MEP services, these manufacturers reported—I don't know if you are familiar with these statistics or not, so let me read them, and if you would comment on them—52,000 jobs created or retained; $6.8 billion in new or retained sales; $1.1 billion in cost savings; and over $1.7 billion in private investment leveraged. If those are accurate statistics, those results came from a $100 million Federal program.

That seems to be pretty good leveraging. What do you think? Do you think those numbers are accurate, or maybe the impact of MEP was marginal, and there would be some of these statistics existing if MEP didn't exist? Are you familiar enough with the program to comment on that?

Mr. MARBURGER. I am somewhat familiar with the program, and you, Mr. Chairman, answered a lot of my questions before I could get to them. But, yes, I do believe that some of those things are happening. It is not clear how much of that would have happened without the MEP funding. I do believe that industries and companies that gain benefits from MEP are bound to be happy with them, and I don't want to criticize the management of the program by NIST. I think——

Mr. MOLLOHAN. I know you are not criticizing the management.

Mr. MARBURGER. So I think that these are probably well run programs. The first question is to what extent are funds that are being used for that program could be used on activities that simply wouldn't ever happen if they weren't funded there? And I believe that the type of basic research that—basic and applied research that NIST does, and that it does much of it in cooperation with industry and in laboratories, this has very close ties in its core programs with industry and universities. That work has a potentially much higher benefit in terms of jobs and competitiveness and economic growth than the sort of "one accomplishment at a time" pace of MEP and ATPO.

So it is a question of putting your money where the biggest payoff is in the long run. I believe, that we would get much more if we funded NIST to be—for example, to be more active in taking leadership and setting standards for nanotechnology applications worldwide. NIST is acknowledged to be a leader in Europe and Asia in the standard-setting process. We ought to be funding them to do more of that. And that is part of their core activity. But they are also leading the way in characterizing—I used nanotechnology as an example and may as well continue. NIST is leading the way in characterizing nanotechnology products in a way that can be used by the people who study the health effects of nano. There is a lot of concern about that right now.

Well, we can't study the health effects unless we know what is in the people. And NIST is where people turn for techniques for understanding the characteristics of these new substances. So it is that kind of a thing that we could be funding rather than the one-company-at-a-time job creation, which is—you know, it is—I don't deny its importance, but if you have got a choice to make, I would spend our money first on this, and if we can find money somewhere else to do some of these activities, then that should be evaluated very carefully. But I would say we have got a priorities problem.

Mr. MOLLOHAN. So your position, if I might restate, isn't that MEP or TIP don't have value or potential value in and of themselves. It is that the money is within the NIST budget. Being in the NIST budget, you would have a different priority?

Mr. MARBURGER. That is correct. I do have some sympathy with the notion that private sector does have an obligation to fund that sort of thing, and I know that some companies find it hard to get access to private-sector funds. But I would be willing to work harder on helping private sector find ways to do that. For example, part of the American Competitiveness Initiative is to make the tax credit for research and experimentation in the private sector permanent and to simplify it so more companies can take advantage of it. It is conceivable that incentives like that could create pools of funds that could assist in the tech transfer end of the business.

So I think we have got other tools that we can use to address some of these functions. We should try to do that.

BASIC RESEARCH AND TECHNOLOGY TRANSFER

I just wanted to add one thing to that. The private-sector assets, revenues and the private-sector investment in research is growing at a pace greater than that of the domestic discretionary budget at this time. And I have spoken over the past year about the desirability of finding ways to encourage the private sector to invest a greater portion of its assets and resources in more basic research or research and development that is a little bit closer to the tech transfer functions. So I just wanted to add that as an important——

Mr. MOLLOHAN. Well, basic research isn't in that area. Basic research is as you have described it. There is a real consensus that the Federal Government ought to be investing in basic research. But these are applied programs, and I would suggest that while there may be other ways of getting it. There could be some tax incentive that could incentivize this kind of activity. I am sure that this was considered when the authorizing legislation was developed. Nonetheless, this is impressive leveraging—if these statistics are correct—over $1.7 billion in private investment leverage. This is the number that NIST reports, so that is a pretty impressive leveraging of private sectors.

But I guess my point is—and it is not to try to tie you down or anything, but it is to get an appreciation for your primary reasons for supporting the zeroing out of these two programs, and it is that dollars are scarce, it is a zero-sum game, and given your predisposition about the prioritizing of that and favoring basic research, you just think that money could be better spent at NIST basic research, it is not that you are per se opposed to these programs?

Mr. MARBURGER. That is correct.

Mr. MOLLOHAN. If that is a fair assessment?

Mr. Frelinghuysen.

MATH AND SCIENCE EDUCATION

Mr. FRELINGHUYSEN. Dr. Marburger, I want to get back to how we improve math and science education. The increases for math and science have been primarily in the Department of Education programs. For the National Science Foundation, the American Competitiveness Initiative prioritizes basic scientific research over education programs. The NSF education request, as you are aware, falls far below the amount authorized by the COMPETES Act.

I suppose the basic question, are the National Science Foundation education programs effective? And if they are, which ones would you single out for perhaps being the most successful?

Mr. MARBURGER. I would first like to point out that the President's 2009 budget request does request about a 9 percent increase in that part of the National Science Foundation that deals with education. So that is a sort of vote of confidence in NSF programs there.

I think that the proper funding of research in science and math education is an important part of the American Competitiveness Initiative and obviously an important part of the COMPETES Act, so there is no animosity toward the National Science Foundation programs. The fact that it is only 9 percent is—well, which I think is a healthy increase at a time when the domestic budget is being held to 1 percent. But the fact that it is only 9 compared to 15 or 20 percent, which is the amount—20 percent is the amount that the physical science budget would increase at NSF under this budget is just an indication——

Mr. FRELINGHUYSEN. Those who have reviewed these programs have they found them to be effective, and it all boils down to what part of this ensures that we are actually, quote, competitive.

Mr. MARBURGER. Yes.

Mr. FRELINGHUYSEN. And how we measure that.

Mr. MARBURGER. There are two things I want to say in response to that question. The first one is that the National Science Foundation itself, as you know, most of its money goes out to university-based research programs. The NASA Science Foundation requires that the research grants that it gives under these programs have evaluation tools built into them so that they have accumulated a lot of information about what works and what does not in their research programs.

Now, that is the first sort of general answer. Secondly, the Department of Education and OMB in cooperation with my office have launched a study of the very large number of education programs, and particularly in math and science, spread around the entire Federal Government. There is a large number of such programs. They established a committee, an interagency committee, called the ACC, Academic Competitiveness Council, I guess, which made recommendations about assessing all of these programs. And under the actions of that committee, my office was asked to prepare a document that gave more detail and more direction to agencies about how they might go about evaluating these programs to find out what does work and what doesn't, because most of these programs are not evaluated in a way that would allow you to tell if they are working.

Mr. FRELINGHUYSEN. So they are being evaluated?

Mr. MARBURGER. They are being evaluated. Some of them are being evaluated now, and more of them will be evaluated during the coming months as this process rolls out. Once again——

Mr. FRELINGHUYSEN. Because these are the programs that provide the very underpinning if we are ever going to get ahead of what is occurring in China and India where the numbers are staggering. The teaching of English, in the second or third grade, I assume both science and mathematics, the statistics, and you are pretty familiar with them, are pretty shocking, a huge wake-up call. You say there is oversight through this new acronym or this new group?

Mr. MARBURGER. Yes. I am satisfied that we are moving toward having a much more uniform and widespread evaluation process for all education programs throughout the government, not just the ones in NSF or the Department of Education, but elsewhere as well. I think it is needed, and we are supporting that effort. We are probably doing some things right. We could probably do a lot of things better. And we have to sort out which is which.

AMERICAN COMPETITIVENESS INITIATIVE

Mr. FRELINGHUYSEN. Well, you are in the critical position. So we are supportive of whatever you are doing to crack heads and make sure that things are coordinated, one hand knows what the other hand is doing. I just wanted to touch basically, obviously the cornerstone of the American Competitiveness Initiative is the National Science Foundation basic research, which obviously receives a pretty healthy increase, 13.6 percent. The biggest increases, correct me if I am wrong, are for math and physical sciences, engineering, computer sciences, and cyber infrastructure. Why are we prioritizing these specific disciplines or technologies over others?

Mr. MARBURGER. This is the area that we have been hearing about for the last—almost a decade from industry, from educators, from scientists and universities and the national academies. This is the area where there appears to have been the greatest lag in funding, and the greatest mismatch between opportunities and abilities, capabilities because the funding has been lagging. The physical sciences——

Mr. FRELINGHUYSEN. I am interested to know, you are in the process of responding, what data supports——

Mr. MARBURGER. There are a large number of—I will be glad to provide reports——

Mr. FRELINGHUYSEN. So there is substantive data that supports these types of investments?

Mr. MARBURGER. Yes. These investments are in the areas that support the information technology, nanotechnology and instrumentation, the measuring instruments that are used in all areas of science. The physics and chemistry and information technology, computer science and systems engineering, all of these things are very basic components of practically every field today. Most contemporary research——

Mr. FRELINGHUYSEN. The general consensus is, and I am a believer, that these will pay the biggest dividends. Do they match their counterparts from what we can gather from our own intelligence gathering of what is happening in parts of India, China?

Mr. MARBURGER. Other countries are aware——

Mr. FRELINGHUYSEN. The Pacific Rim?

Mr. MARBURGER. I give you one example. Just last year Russia decided to make a huge investment in nanotechnology, just huge. It is $1.5 billion per year, which is comparable to our investment. It is just an amazing investment. It is structured very differently. It doesn't have quite the same emphasis on the basic research that ours does. But that is an example of a type of investment that countries are willing to make in these areas. They are building the kinds of infrastructure that are sustained by these physical science budgets and NSF and the Department of Energy and elsewhere. And we know that they are making those investments there, particularly because they see the payoff. So we are competing.

Mr. FRELINGHUYSEN. Just to sum up, we are doing it here, and it seems that everybody has a piece of the initiative. I mean, there are lots of consortiums or consortia that are around there. But who is sort of pulling all the disparate parts together such that we would have some way of knowing whether we would match the Russia initiative? I assume the Chinese are not asleep at the switch here, either through their own inventiveness or through what many of us suspect is their ability to, shall we say, cop information.

Mr. MARBURGER. Congress has mandated a series of reports both from—in the case of the administration, the President's Council of Advisors on Science & Technology has taken on this responsibility and from the National Academies to report periodically and frequently on the status of the nanotechnology initiative in this country and compared with other countries. And there are reports available that are pretty current that have these data in them. It shows our investment compared with Asia and Europe.

Mr. FRELINGHUYSEN. There are people like you, and people who serve on the National Science Board, through whom these reports filter such that we have a pretty good grasp of what everybody is doing in university-based research and different medical centers, and within the DOD.

Mr. MARBURGER. Yes. Our office runs a national coordinating office for the National Nanotechnology Initiative, and they produce copious reports. I will make sure that those reports are available to you.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Thank you.

VISION FOR SPACE AND FUNDING TO EXECUTE IT

Doctor, you used the words when we were talking a little earlier about the necessity for dependability in funding, dependability on direction in some of these programs. I would say the stability in them in every way. As I look at NASA, I don't know any other agency that has had less stability, neither programs or funding.

I would like to ask you a few questions about NASA. Let me begin with the notion which we get a lot of up here that the current vision focuses on space shuttle, space station programs, phasing out shuttle, doing something with station, followed by human exploration of the Moon. And there are those who would argue that that results in a deemphasis of the aeronautics accounts and the science accounts and the education accounts particularly. First I would like to ask you, were you involved with the development of the President's vision for exploration? Did that happen before you came, or were you——

Mr. MARBURGER. I was involved with that, yes.

Mr. MOLLOHAN. How did that happen? What led us to the conclusion that the President would initiate the exploration vision that he did?

Mr. MARBURGER. The primary driver, the proximate cause for that vision exercise was the Columbia Accident Investigation Board report that found that the vision for NASA in general was in need of renewal and reexamination, that there needed to be a high-level statement of a program and a vision for what NASA was trying to do, where it should be going. And that recommendation in the accident investigation report triggered a number of activities. Another commission was formed which reported, and an extensive policy and exercise occurred in the White House involving NASA, and at the end of which the President made a speech and issued a policy statement on the vision. And I have given speeches about this giving my perspective in detail on this that I would be glad to make available to the committee.

Mr. MOLLOHAN. Would you do that?

Mr. MARBURGER. I will do that.

In my view, a practical vision for space is rather constrained by physics. We need to make sure that we have the ability to get equipment up and to maintain complex operations in space, which is subject to physical constraint, one of which is just the cost of getting material up, various kinds, out of Earth's gravity. So I attempted to advise the policymaking process based on the perceptions of my staff. Obviously I was working with experts on this. We advised the policy process on this regarding the constraints we thought were built into the science of space travel, if you wish, and space exploration, and the current vision does include those aspects.

I think that the current path that NASA is on is a reasonable one and sustainable. In the President's statement on this, on the exploration vision, he emphasizes the importance of having a sustainable step-by-step process and to try to get away from the notion of sort of one-shot spectacular missions that are very expensive, but that don't accumulate an infrastructure that can be used to make subsequent missions both less costly and safer. So the whole program of phasing out the shuttle and working on a new generation of crew exploration vehicles that can serve the shuttle, as well as going beyond to the Moon and——

Mr. MOLLOHAN. Service station, a service station?

Mr. MARBURGER. Correct. I think that is a reasonable vision. And we do try to fund NASA on a regular basis. It is not easy. Of course, the President did request a budget within a long-term framework in 2008, but the omnibus bill failed to support it. That causes problems. The NASA budget is particularly sensitive to these shifts in funding.

So I think the administration has a pretty clear picture of where it wants to go and how it should be funded, but we desperately need to be working with Congress to make sure that we have got the funding on a pretty smooth path.

Mr. MOLLOHAN. So you are affirming your support for the vision, generally——

Mr. MARBURGER. Yes.

Mr. MOLLOHAN [continuing]. As it was proposed by the President as currently being carried out given the funding you have. You used the term reasonable and sustainable.

Mr. MARBURGER. Yes.

Mr. MOLLOHAN. Not optimal, I assume.

Mr. MARBURGER. Optimal is hard to define.

Mr. MOLLOHAN. It definitely involves more money. But could you give us your thinking about the concerns expressed by people that the emphasis on exploration does come right now given the President's request at the expense of science, aeronautics education? And it is said that Dr. Griffin makes a case that science is, given his budget and his direction, not deemphasized, that it is not adequately funded, but it is in the balance of things fairly funded. There are a lot of people that don't agree with that, and I am asking for you to comment and give us your thoughts about that. In other words, it is a balancing question within NASA. Do you agree with how the administration——

Mr. MARBURGER. First of all, if you have more money, you can do more things. Secondly, NASA is doing a lot of science. After NIH, NASA has the largest share of the science budget, the nonmilitary, nondefense research budget. NASA has the greatest share. NASA is currently flying about 60 science missions. They are up there gathering data. And that is just hugely more than anyone else is likely to have in the near future.

Mr. MOLLOHAN. When you are at these conferences, and all your science-biased colleagues come up to you and start banging on you, is that the response you give them?

Mr. MARBURGER. Yes. I look them in the eye and I say, can you tell me how many active science missions NASA has now? We know about the rovers on Mars, we know about the Hubble telescopes. How many? Well, they usually guess about 15 or 20. Well, there are 60. And so I tell them, how many do you think we ought to have? You can always put more up, but you need—you know, it is just a question of money. So I say that for the type of science that we are getting, and it is very exciting stuff, we are making a big investment in NASA science.

There are pressures on NASA to do even more because we have a science community that sees possibilities. They would all like to have their satellite programs. And we have a very aggressive, competitive, capable space science community out there that is pushing for more and more. And I think that it is very important for us to have a clear idea of what we should be doing first so that if we do run short of money for one reason or another, there is a hiccup in the funding or another accident occurs, and we have to incur great expense, we know what we should be sustaining.

Congressman Ruppersberger asked about the Webb telescope, for example. Well, that is a high-priority project that NASA is just going to keep doing regardless. And there are a number of science projects in that category. But I think it is a mistake for us to just try to do everything that everybody wants to do. We——

Mr. MOLLOHAN. Well, surely that doesn't happen. But I had here a couple of years ago, or maybe it was last year, a list of all of the science programs that were being pushed out or terminated, and it was a pretty large list. So there were projects in the queue that for budgetary reasons were cancelled.

Mr. MARBURGER. In my view, that was a direct result of the very tragic accident that took the shuttle program off line and incurred.

Mr. MOLLOHAN. Because NASA had to pay for that out of its hide, so to speak.

Mr. MARBURGER. Yes. It sent ripples through the NASA budget.

Mr. MOLLOHAN. But NASA had to cover that cost within its own budget instead of having a supplemental or an emergency funding to pay for that.

Mr. MARBURGER. There was some return-to-flight funding during that period. But, NASA deals with these big projects that have intrinsic difficulties that create cost overruns and schedule slips. You are pushing the edges of technology on these things, and there ought to be some flexibility in their budget to do that.

Mr. MOLLOHAN. You know, I know there is a lot of concern expressed about the vision, the vision being underfunded, I mean, by some accounts $4 billion, $4 billion-plus, and then in addition to the underfunding for the science and aeronautics and education. So do you agree with that? Do you disagree with that? Do you push for more funding for NASA in your efforts?

Mr. MARBURGER. I talk about it differently from the NASA Administrator. He has a certain discretion about how he does these things. Since you mentioned education and aeronautics now, and I haven't responded to it yet, let me talk about those first and then the other.

Mr. MOLLOHAN. Please.

AERONAUTICS PROGRAMS AT NASA

Mr. MARBURGER. NASA has basically reorganized its aeronautics function, I think, in a very healthy way, restructured it to emphasize a smaller number of more focused objectives, back to basics as it were. There has been a lot of planning activity and policy-level activity on the aeronautics program. The President approved an aeronautics policy, and now we have an aeronautics strategic plan, and the expenditures that the President is requesting in the 2009 budget are consistent with the new look that NASA has given the aeronautics part and with the policy and strategic plans that have been developed.

So I am comfortable with the direction of aeronautics. It definitely has been a change. There has been a refocusing, as it were, a reprioritizing of their mission. So I think that aeronautics and NASA is on the right track now.

As far as the education part, well, that has to be evaluated along with all the other education programs that we have been talking about. NASA has real assets for education. Kids love it, grownups love it, and they make a lot of educational materials available.

Mr. FRELINGHUYSEN. Just if I can ask the Chairman. Why is NASA not part of the American Competitiveness Initiative along with NOAA?

Mr. MOLLOHAN. Absolutely.

Mr. MARBURGER. The reason NASA and NOAA aren't part of the doubling track, for the American Competitiveness Initiative is that—there are two reasons. The first one is that they are more nearly adequately funded for the missions that they perform than these other parts of the science agency community; and secondly, that the direct product of their research is less relevant to long-term economic competitiveness and to the line of products that sustain the American economy at the likely future economy. So while there are important economic aspects, big economic impacts, of the operations, space operations, for example, weather and so forth, the research products are less directly relevant to the technologies that are likely to be—I mean, just to make it clear what I am saying so that——

Mr. FRELINGHUYSEN. I don't want you to get too excited by responding, but this is the Chairman's time. The issue of sustainability——

Mr. MARBURGER. For example, cosmology or understanding dark matter in space, those are very important issues where there are many important opportunities in science. You can call them physical science as well. But they don't lead to technologies that are likely to be important in our economic future. You can get spin-offs from the various——

Mr. FRELINGHUYSEN. Our economic future is certainly connected to the 72 percent of the world's surface that is oceans.

Mr. MARBURGER. That is correct.

Mr. FRELINGHUYSEN. And the way we treat our oceans—and obviously we have a lot of scientific assets directed towards——

Mr. MARBURGER. That is correct.

Mr. FRELINGHUYSEN. Talking about competition, look what the Chinese and Japanese are doing out there in terms of their fleets and the depletion.

Mr. MARBURGER. Those parts of the NASA budget should be funded, and, in this request that we are discussing here, the President is asking for increases and dollars for carrying them out. But the entire agency budgets, research budgets, don't have the same level of sensitivity to economic competitiveness.

So, I am trying to give you the rationale for these decisions, and they have been made carefully and based on analyses and extensive reports. It is not something that we just thought up. We try to listen to the communities out there and respond to what they think is important.

So to get back to the funding gap, as it were, that we here discussed in connection with NASA, this is where the emphasis that the President has made on sustainability and step by step comes in. We think it is important for NASA not to have big increases and then decreases in its budget. We think that it is important for NASA to have a budget envelope that Congress can support and sustain administration after administration, if you wish, not something that is going to go up and down with the fashions of the moment or the political interests of a particular administration, because this is something that takes place over many, many years, decades.

Mr. MOLLOHAN. I would subscribe to the notion that we should have sustainable funding, and it should be level, and I think there would be a lot of concern, which I would share, about the adequacy of it, and it should be sustained at a higher level in order to achieve the goals of the vision and at the same time to fund the other terms. But thank you very much for your thoughts on that.

NASA AND THE ACI

Going back to Mr. Frelinghuysen's question about NASA being a part of the American Competitiveness Initiative, it is interesting to me that you said because the products that come out of NASA aren't as relevant, I think there would be a lot of people on Capitol Hill, and I would be one of them, that would think and believe that actually it is a part of NASA's authorization to be very concerned with and very focused on meeting goals with regard to technology transfer and bringing technologies to the economy that directly impact on America's competitiveness. I think, and please correct me if I am wrong, that is a part of the statutory mandate; is it not?

Mr. MARBURGER. I believe so. And my remarks may have been misleading in this respect. There is no question that NASA and other agencies have important products that have an important impact on our competitiveness, but that there is a differentiation and impact among different areas of science. The people who are concerned about information technology, communications, telecommunications, materials, energy——

Mr. MOLLOHAN. Again, kind of emphasizing the basic research——

Mr. MARBURGER [continuing]. Biomedical research. All of these things are pointing to these agencies as being significantly underfunded for the role that they play. They are not pointing to NASA as being significantly underfunded for the role that they play.

So it is dangerous for me to make invidious comparisons here. I don't want to do that because all of these agencies are carrying out their missions quite well, but there are some differences at the level at which we have been funding these things, and we have had a situation where we have let a certain very key area of science go underfunded for decades, and we are trying to fix that.

Mr. MOLLOHAN. It is basic research?

Mr. MARBURGER. Basic research in certain areas of physical science. And NASA and NOAA and a number of other agencies, while very important agencies doing their jobs well, are not as significantly underfunded as these key prioritized agencies. And even in the materials that were produced at the time that the President announced the American Competitiveness Initiative, we tried to explain that there were other agencies, and we particularly mentioned the Department of Defense as being a key agency, that had traditionally invested in research in this area that needed to increase it, but it was not being proposed to be put on a doubling track. Only these most seriously underfunded agencies relative to their missions were put on that doubling track according to the President's principles.

You know, I tried to explain the rationale for a fairly targeted initiative. The idea was that within an overall constrained budget, you had to have some priorities, and priorities had to make sense, and we tried to design priorities that would funnel the dollars to the highest leverage, most needy areas, high-impact areas, while acknowledging the importance of all areas to achieve economic competitiveness; funding those high-priority things first, making sure that that got done, and then subsequently when balance is restored, we can, you know, move ahead on all fronts if we can afford to do that. So that is sort of the picture here. It is all about priorities.

REVISITING THE VISION FOR SPACE

Mr. MOLLOHAN. One of my last questions with you with regard to NASA has to do with the basic vision, concept at this point in time, and I say NASA is one of those agencies that has been least stable in its funding profile, and that we try to redefine or some try to redefine every year. But there is significant thinking out there in the community, rethinking, of the vision, which I am sure you are aware of, and if I can just read a few paragraphs from Aviation Week and ask you to respond to this.

First introductory paragraph: Influential leaders of the space community are quietly working to offer the next U.S. President an alternative to President Bush's vision for space exploration, one that would delete a lunar base and move instead toward manned missions to asteroids along with a renewed emphasis on Earth environmental spacecraft. Participants in the upcoming meeting contend there is little public enthusiasm for a return to the Moon, especially among youth, and that the Bush administration has laid out grandiose plans, but has done little to provide the funding to realize them on a reasonable time scale. Another contention is that abandoning the President Bush lunar base concept in favor of manned asteroid landings could also lead to much earlier manned flights to Mars' orbit where astronauts could land on the Moon. And it goes on to more specific justifications for revisiting the vision. But are you familiar with this thinking?

Mr. MARBURGER. Yes. Yes, I am.

Mr. MOLLOHAN. And my first question was, learning progresses and ideas mature, and people begin one direction, and they get so far in the direction and decide, gee, there is a better one, but they wouldn't realize there was a better one if they hadn't pursued the first vision in this case. But was this notion a competing one? Was this vision that this group is touting a competing one of the President's vision at the time?

Mr. MARBURGER. Yes. You know, people have been conjecturing or conceptualizing things to do in space and what our approach should be for decades, and nearly everything that you can think of, including missions to asteroids and buildings, structures, and so-called Lagrange points, which are points in space, all of these things were more or less in the air, have been in the air for a long time. And so when we began looking around, and others, at the time the vision was assembled, there were scores of ideas about how to proceed.

With respect to the specific ones that you mentioned, I think there are some good ideas in there and some not so good ideas. I certainly believe that Earth observations are very important. Probably the highest priority for space operations for this country should be Earth observations. The most interesting thing in the solar system is the planet Earth, and that is where we are. So I agree that that should have a high priority.

As far as visiting asteroids, I don't regard that as a good idea, except in connection with a larger plan that does include the use of the Moon. The Moon is unique in being a source of material that is not deep in the Earth's gravity well. It is unique. There is nothing else like it. It is the closest thing, and it provides a stable base. Unlike anything else that is accessible to us, only the Moon provides a stable base for complex operations. And the reason you go to the Moon is not to just repeat the Apollo experience, but because you want to establish operations there that could very well serve the Earth-observing capabilities that we have in a way that reduces the cost of sustaining them. It is conceivable that there could be commercial operations and commercially successful operations on the Moon in the future where it is inconceivable to me, at least within centuries, that you could have similarly commercial viable operations anywhere else. The Moon offers a source, sort of an infrastructure that can be exploited for all other space exploration. So that is what I think.

Mr. MOLLOHAN. And this group would disagree with that very premise?

Mr. MARBURGER. This group disagrees with that, and I think——

Mr. MOLLOHAN. I am not going to mention all the folks.

Mr. MARBURGER. I know about that conference. But I think they are wrong, just to make it clear. I think they have some good ideas, but on that one I think that that is a mistake.

Mr. MOLLOHAN. Is there debate within the administration on that issue——

Mr. MARBURGER. Not particularly. You know, the administration does listen to outside advice.

Mr. MOLLOHAN. Are you sure?

Mr. MARBURGER. And there is a debate within that community. There is one sector that thinks the Moon is the thing, and the reasons that many people think the Moon is important are somewhat different. In other words, people have different reasons for going to the Moon. Other people favor building a big infrastructure in something called the Lagrange point, which is a gravitationally stable place where things don't float away if you drop them. Once again, there are serious disadvantages with that and so on. There are a number of factions out there that have their—and some people think that we should just go right to Mars and not worry about building all of this infrastructure in between. All of these things have to be analyzed seriously and continually.

Mr. MOLLOHAN. Are these either/or visions?

Mr. MARBURGER. Not necessarily. Once again, it depends how much you want to spend. You know, the more money you put on the table, the more different things you can do. But to my mind, looking at that time from a dispassionate point of view, my responsibility, I looked at all of these things and listened to all of these people, and it seemed to me that there are certain things that you would want to do whatever else you did. One of those things is exploiting whatever resources you can find on the Moon. Whatever else you do, that is the big thing that is up there that has mass that—it is very expensive to get mass out of the Earth's gravity.

Mr. MOLLOHAN. Is there momentum out there for a change in the vision that we just described, and are those who are proposing, are they credible? Are these proposals and these——

Mr. MARBURGER. We have a very aggressive, capable, as I said before, capable community of space scientists, many of which have their own ideas about how to do things and what to do. There are organizations, clubs, Web sites that have formed around different approaches to this so that you can probably find momentum in almost any direction.

The trick here is to try to be responsible about it; what are the criteria that you would use to select among these things and prioritize them. In my view, it is pretty obvious that the Moon has got to be a major objective for any space vision, and, number two, that we have to get away from this notion that we are just there to impress other countries and plant flags and so forth. That is not why we are there. There are other really pragmatic reasons, including science. Science is one of the functions that should be served by space exploration, and very important science can be done on any of these missions, but they can all be sustained by a development of complex operations on the Moon.

Mr. MOLLOHAN. Have you spoken on this topic before this hearing?

Mr. MARBURGER. Yes, I have. Yes. A number of times.

Mr. MOLLOHAN. Is it available?

Mr. MARBURGER. Yes. I will provide——

Mr. MOLLOHAN. We can go online probably and find it.

Mr. MARBURGER. I will make sure that you get it. I gave a talk, an actually quite well-received talk, to an annual symposium, the Goddard Space Flight Center, on this 2 years ago, and it is on my Web site. And, in fact, in about 2 weeks, I will give another one of these talks.

Mr. MOLLOHAN. On this topic?

Mr. MARBURGER. On a similar topic, yes, exactly. And I will make sure that once I get it written——

Mr. MOLLOHAN. Thank you, Doctor.

SCIENCE EDUCATION

Mr. FRELINGHUYSEN. Very briefly, I would just like to get back to planet Earth for a few minutes here and get back into the issue of science education. You are involved in the Academic Competitiveness Council. Are you familiar with their work and their recommendations?

Mr. MARBURGER. Yes.

Mr. FRELINGHUYSEN. Obviously their job is to examine, see where things are working, where they are not, whether there are efficiencies. You are familiar with their recommendations?

Mr. MARBURGER. Yes, I am.

Mr. FRELINGHUYSEN. Do you have any reaction to their recommendations? And you are aware that the council found a general lack of evidence, effective practices and activities in STEM education? You are familiar with all of those, correct?

Mr. MARBURGER. Yes, I am.

Mr. FRELINGHUYSEN. What is your feeling on those recommendations?

Mr. MARBURGER. My feeling is that they are in the right direction, and that they need to be articulated and carried out. The Academic Competitiveness Council has charged my office with coming up with methodologies for further guidance for carrying out some of these suggestions.

NATIONAL SCIENCE BOARD

Mr. FRELINGHUYSEN. And tell me, didn't the National Science Board make some recommendations to your office?

Mr. MARBURGER. Also the National Science Board also made recommendations that are separate from the Academic Competitiveness Council.

Mr. FRELINGHUYSEN. Where do those recommendations stand? This is the whole issue of better coordination for STEM education and the National Science Board. Has that been done?

Mr. MARBURGER. The recommendations of the National Science Board—or the National Science Board is an external advisory or oversight group for the National Science Foundation, and the Academic Competitiveness Council is an internal administration executive branch organization that is——

Mr. FRELINGHUYSEN. So you are reviewing the American Academic Competitiveness Council recommendations?

Mr. MARBURGER. Yes. So we have a specific task under the Academic Competitiveness Council recommendation, and we are considering what to do with the recommendations of the National Science Board that have recommended a number of things. They go in very different directions.

Mr. FRELINGHUYSEN. Well, just out of my curiosity, are you creating a standing committee on the National Science Board recommendation?

Mr. MARBURGER. We are going to respond to the National Science Board recommendation with a committee that is probably a little bit different from the committee that they actually recommend. I don't know whether they were familiar with our structure or not, but we have a structure in which that function would fit very well that we plan to use in the National Science and Technology Council. So we are prepared to be responsive to the National Science Board recommendation fitted within the framework that we have to operate.

Mr. FRELINGHUYSEN. Well, I assume the National Science Board is pretty familiar with the Academic Competitive Council and their recommendations.

Mr. MARBURGER. I hope so. I hope so.

Mr. FRELINGHUYSEN. I know that the National Science Foundation is increasing, I think, by 32 percent their graduate fellowships. I am sure that is admirable, they do great work. Why is there a flat funding for the National Math and Science Partnership and what they call the NOYCE scholarships?

Mr. MARBURGER. Those are two different programs. The NOYCE scholarships will, in fact, increase in the President's 2009 budget request. The Math and Science Partnership program will not increase, that being funded primarily in the Department of Education. Did I get that wrong? I do believe that the NOYCE scholarships will increase.

Mr. MOLLOHAN. I am not sure that is right.

Mr. FRELINGHUYSEN. The increases are pretty small, and if you compare them to the graduate fellowships.

Mr. MARBURGER. Okay. My budget expert says that there was an increase of about 5 percent in the NOYCE scholarships. It is a matter of fact, we can straighten it out among ourselves, but the intention was for that to go up. Once again, it would go up more if there were more money on the table and the priorities were different.

Mr. FRELINGHUYSEN. The priorities, not to go argumentative, 32 percent for graduate NSF fellowships, obviously, is a priority, you have to measure that against what we might be doing on the math and science partnerships, which are pretty important as well.

Mr. MARBURGER. Right. The math and science partnership program is being funded by this administration primarily in the Department of Education. So there is no——

Mr. FRELINGHUYSEN. Again, you are part of that science hierarchy, and we hope that the resources will be—I won't say evenly divided——

Mr. MARBURGER. The Department of Education does science, too, but they particularly run these big programs for schools. The Department of Education has a somewhat different function than the National Science Foundation. The National Science Foundation does research, and it is focused on graduate education much more than K through 12. The math and science partnerships are more of a K-through-12 function that is, that we would like to see expanded in a program that is suitable for the Department of Education. So I accept all of the Federal agencies as appropriate domains for carrying out the signed education mission.

Mr. FRELINGHUYSEN. Thank you for what you do.

Thank you, Mr. Chairman.

Mr. MOLLOHAN. Thank you, Mr. Frelinghuysen.

ICE BREAKING

Doctor, last year, it was some interest to the committee that the National Science Foundation expressed concern about their ice-breaking capability. There are some studies underway, interagency discussions were underway then, I don't know what the status of those are now. I would like to ask you what the status of those are now.

I would like you to talk to the committee about the problem we face with regard to ice breaking capability, what the interagency studies are coming up with, with regard to solutions and what your personal feelings about it might be and how you would suggest that the committee approach that, it involves a lot of money, you are not asking for it. How do we address this problem?

Mr. MARBURGER. So my office has been working to understand the problem and to make sure that the National Science Foundation had the ability to gain access to the important science facilities in Antarctica, the South Pole particularly. And we participated in a solution to their problem, which was to make sure that they had money in their budget to arrange for ice-breaking services——

Mr. MOLLOHAN. You participated in a solution, I am sorry?

Mr. MARBURGER. Yes, in the current situation, that is working, which is that there is money in the National Science Foundation budget for them to procure ice-breaking services so that they can have access to their South Pole stations. Their arrangement includes providing a relatively steady stream of funding to the Coast Guard for backup services, but as I understand it, they are using their funds for primary services to rent or lease ice-breaking capabilities from other countries to serve the South Pole station. So that is the least expensive way for them to carry out their science mission.

Now the issue of future ice-breaking capabilities for the South Pole is—well, for both poles actually, is an issue that is larger than just science. The National Science Foundation—the missions of the National Science Foundation are not the primary drivers for ice breaking capabilities. And so, consequently, there are policy level processes going on currently to try to get all the actors together, the State Department, the Department of Defense, the Department of Commerce and all the other actors who have a stake in this, to work together to develop a policy for going into the future.

I do not regard the ice breaker issue as primarily a science issue. It is a broader issue and needs to be addressed in a broader context. So what is driving this, there are two things. One is that the current ice-breaker capabilities of the Coast Guard are aging, need to be renovated or replaced, number one. And number two, the polar regions are increasingly interesting, particularly the north polar region, the arctic region, where the ice is melting rapidly, and there is a great deal of rapidly growing interest in commerce and natural resource exploitation, extraction and so forth that go way beyond the science interest. So those agencies that have those aspects in their portfolios need to come together and agree on the path forward, and that, such a path is being explored currently at the policy level.

Mr. MOLLOHAN. Mr. Frelinghuysen has a question.

SOUTH POLE TRIP

Mr. FRELINGHUYSEN. In the interest of full disclosure, I had a chance to travel with Dr. Bement and two of his predecessors, Rita Colwell and Neal Lane, a trip to remember, to the South Pole. It was fascinating to me, the partnership between the National Science Foundation, all those countries and how the military provides access. While I am certainly a red-blooded American, it did bother me that they had to use a foreign ice breaker. It was considerably cheaper, quite honestly, than if we would had perhaps our own Coast Guard there. But I would agree with you from what I can gather. There is a larger picture. I was hugely impressed, so that is why I am somewhat wearing my NOAA watch today. So when you don't include them in the American Competitive Initiative, given all the good things they are doing down there, I was a little bit—but I would agree. The research down there is absolutely fascinating, and we need to get in there.

I thank you, Mr. Chairman.

Mr. MOLLOHAN. Sure.

Well, it is my understanding—and I would be interested in hearing about Mr. Frelinghuysen and what he has learned on his trip down there—but that the NSF polar research actually has become the primary use of our ice breakers. And this year, NSF's budget eliminates funding to continue the caretaker status of the Polar Star since NSF does not envision current or future use of this vessel in support of its mission. If that is true, how do you think—well, let me ask you specifically, is a report planned on this? You have got an interagency study going on?

Mr. MARBURGER. I am not aware of a report in preparation. There is an early policy process that is occurring.

Mr. MOLLOHAN. It can't be too early, Doctor, this has been going on for I can't tell you how many years.

Mr. MARBURGER. Well, the policy process that I am referring to is one that includes all, appropriates the recent developments in the Arctic and the rapidly increasing interest there; brings in these considerations, brings in the geopolitical considerations that make it mandatory, I would say, for other agencies to participate. I do not regard this as primarily an NSF problem or a science problem. This is, the issue of ice breakers is one that has to be solved in a much broader context.

Mr. MOLLOHAN. Well, are you involved in that solution, because if it is not only an NSF or a sciences issue, it is in part an NSF and a science issue.

Mr. MARBURGER. That is correct. My interest is in making sure that the National Science Foundation has access to their polar station. How they get that access is less interesting to me. Now as a member of the administration, as a U.S. citizen, I care a lot about the ability of the U.S. to be able to operate in the polar regions, but my specific interest as a director of the Office of Science and Technology Policy is to make sure that the National Science Foundation has access to their operations in the South Pole. And I don't want to see the National Science Foundation budget burdened with a national ice breaker program. That doesn't make any sense to me. That is not their mission. And their budget would be artificially inflated if the money to build new ice breakers would be put into it. So that is why I have been insisting that there be a larger process, and I think we need that.

Mr. MOLLOHAN. Well, last year, we had testimony from NSF that the conditions in the Arctic actually were contributing to the necessity of more ice-breaking capability. Which prompts us to ask how are we solving that problem, but you have given us the benefit of your thinking here today at the hearing.

Let me ask you if you would step back and provide a full discussion of this issue and submit it to——

Mr. MARBURGER. Yes.

Mr. MOLLOHAN [continuing]. The committee and give us some direction on where you think the needs are, to what extent the science community has needs, to what extent they are going to be met and how, so that we can stop worrying about how we are going to fund ice breakers if indeed that is not going to be something that this committee is going to have to look at.

Mr. MARBURGER. Good.

Mr. MOLLOHAN. Should we go to the Defense Committee and ask them to come up with some money here? I'll let you submit that for the record.

CLIMATE CHANGE DATA AND ITS AVAILABILITY

A number of changes have been made that the conduct of climate change science and expression of findings have suffered from political interference, and I know you are familiar with that. We are familiar with that. I would like for you, Doctor, if you would, talk a little bit about that issue and what role you envision playing or what role have you been playing to ensure that the integrity of scientific work with regard to climate change is there and that the administration is focused on ensuring it and assuring the public that the science with regard to climate change is being conducted in a scientific way and that the information that comes out of those efforts are available without filtering to the public and the scientific community generally. If you would give us your thoughts on that, please.

Mr. MARBURGER. I think the easiest, most efficient way for me to answer that question is to recall that the—what bill was it, the—a bill was passed last year that required my office to—what was it? Oh, it was the COMPETES Act. I'm sorry, my staff tells me that it was in the COMPETES Act that a requirement was transmitted to my office to issue a guidance to all the agencies that provided for a complete and open transmittal of scientific information. I am sure that one of the contributing factors for that language was the concern that you have expressed about possible interference with scientists who have attempted to express themselves, particularly about climate change. And so we have worded our response to that requirement in a way that takes that into account. And so, consequently, and I don't know if this has gone out yet. It is still in the interagency review.

The process that we have for these official transmissions of guidance to agencies is that we first consult with the agencies to make sure that the wording is something that they can actually carry out. And then we rely on the Office of Management and Budget to go through a process of vetting this, and it is in that process right now. The memorandum that we are sending out, that I am sending out to agencies is basically in process now, and it includes a description of best practices, that there needs to be guidance to scientists as well as other employees that emphasizes the importance of complete, timely and accurate disclosure of scientific information, makes it possible for scientists to interact with media or the public in a free way. And we include the reference to best practices that already exists in some agencies.

So I take this very seriously. I have been—I have resisted sweeping statements about the causes or the reasons or so forth, but I do acknowledge that there have been incidents where guidance was needed and think that it is important for us to be responsive in this way to those concerns, and we have done it. We are in the process of getting it out. It should be out within the next month I would say.

Mr. MOLLOHAN. Just thinking about this, I have no doubt about what you understand the importance of credibility in this area. You are a scientist. But you also have a policy role here, certainly. You probably want to get that out as soon as you can. I mean, that is a part——

Mr. MARBURGER. Yes.

Mr. MOLLOHAN [continuing]. Of what you did.

Mr. MARBURGER. Yes, I want it to be out.

Mr. MOLLOHAN. Sure, you do, but I think it is in your personal interest, given the responsibility that you have, to make sure that that gets out for you and make sure it is clear and unambiguous and that it is followed, but time is marching by. So I just encourage you to—you know, part of legacy.

I have some questions with regard to climate change that I would like to submit for the record, give you an opportunity to respond thoughtfully and completely. We are very interested in that. We have established, last year in the bill, a review, group of that with the academy. I might even want to talk with you about that some time, chat with you about it.

Mr. MARBURGER. Sure.

Mr. MOLLOHAN. Mr. Frelinghuysen, do you have anything else?

Mr. FRELINGHUYSEN. Nothing else. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Again, I am extremely pleased that you are here today and appreciate your thoughts on all these issues. We will follow up in areas that we need to follow up on. And as I said, we will submit these climate change questions. If you have any other thoughts after the hearing that you would like to submit for the record on any of these topics we have covered, we would certainly welcome them, we would value them. You have scarce resources, and we have scarce resources, and we want to apply them certainly with your thinking, and as all of our hearings and input would suggest that your thoughts are very important to us. Thank you very much for your testimony here today, Doctor.

Mr. MARBURGER. And thank you for the opportunity to appear. It has been good, thank you.

Mr. MOLLOHAN. I thought it was excellent testimony. We appreciate it.

[Questions and answers submitted for the record follow:]

FY 2008 APPROPRIATIONS AND AMERICA COMPETES ACT

Dr. Marburger, in testimony before Congress earlier this year you expressed your concern about the impact earmarks have on the science budget, noting that such practice dilutes the research and technology budget. I would note that this Congress, led by a democratic majority, cut the number of earmarks across the board by nearly 50 percent.

I would direct your attention, however, to a far more serious issue, sir, particularly from your perspective, and that is criticism that Congress underfunded the America COMPETES Act. Funding in the omnibus for many COMPETES programs was disappointing – even though it did restore funding for MEP and TIP programs at NIST and included some small increases for math and science education at NSF. Funding for NASA was held at the request level. However, last year, the House of Representatives passed by a large bipartisan majority a CJS appropriations bill that came very close to fully funding NSF and NIST programs under COMPETES and the President's ACI. The Senate passed a similar bill.

However, the White House issued Statements of Administration Policy on those bills stating that the Administration strongly opposed the House and Senate and if either bill were presented to the President, his senior advisors would recommend that he veto the bill.

The White House issued nearly an identical statement to the House Energy and Water appropriations bill, which came close to fully funding COMPETES and ACI programs at the DOE Office of Science.

So I would ask you Dr. Marburger, as one of the President's senior advisors, did you recommend that the President issue those Statements of Administration Policy threatening to veto these appropriations bills, which fully funded the President's own stated priorities?

Answer: Veto message decisions in Statements of Administration Policy are made by the President based on the collective advice of his Cabinet and senior advisors. As the President's Science Advisor, I do not weigh-in on the appropriate discretionary spending topline overall or by individual bill. I do note the inclusion of the language in all FY 2008 Appropriation bill SAPs that commended the Congress for fully funding the President's American Competitiveness Initiative so as to recognize and credit your good efforts in this regard. For instance, the July 24, 2007 SAP on H.R. 3093 read: "The Administration commends the Committee's implementation of ACI with its strong support for the National Science Foundation (NSF) and the standards and research activities of the National Institute of Standards and Technology."

Background

Before the Science Committee a few weeks ago, Dr. Marburger stated, "I want to express my concern about the very serious deleterious impacts earmarks have on the science budget……I hope the Congress will significantly reduce research earmarks in the FY 2009 appropriations process, as it did in fiscal year 2007. Earmarks that divert funding from a merit-based process undermine America's research productivity…… It is now time to end this practice for all research programs." MEP is not earmarked and it was requested in the FY 2008 budget.

Follow-on Questions:

- Your statement also suggested that "earmarks and unrequested grants seriously dilute the core research and facilities at the National Institute of Standards and Technology." Do you believe that the Manufacturing Extension Partnership (MEP) dilutes NIST's core research? How do you reconcile that statement with the fact that this Administration has requested funding for the program for at least the last two years?

Answer: Yes, when the NIST core research program is funded below the level requested and the MEP is funded above the level requested. Even when the Administration has requested MEP funding, appropriations have substantially exceeded the request and substantially under-funded NIST core research.

- Should Congress chose to provide an appropriation for MEP in fiscal year 2009, how would such activities "dilute" – to use your word – the core research at NIST any more than the Administration "diluting" the core research at NIST in fiscal year 2008? What's the difference?

Answer: In FY 2008, Congress funded MEP above the Budget's request and funded core NIST research below the request. This dilutes the ability of NIST to perform its core research at the level recommended by the President. The difference between the Congressional action in 2008 and the President's Budget is Congress did not fully fund NIST core research in FY 2008.

OSTP'S ROLE IN DEVELOPING THE ADMINISTRATION'S BUDGET FOR RESEARCH AND DEVELOPMENT

Dr. Marburger, you serve as the Science Advisor to the President and as the Director of the Office of Science and Technology Policy. In those roles, you are to provide counsel to the President and others within the Executive Office of the President on the impacts of science and technology on domestic and international affairs and to lead an interagency effort to develop sound and balanced budgets in research and technology. Please describe for the Committee how you discharge these responsibilities, particularly as they relate to the development of annual budget estimates that the President submits to Congress.

Answer: The OMB Director and I convene on a virtually daily basis with other senior White House staff as part of a scheduled ongoing and continuous discussion and dialogue on all matters including those related to the budget. I also formally brief and update the OMB Director during the year as necessary on the comprehensive status, progress and problems of the Federal R&D enterprise. Together, the OMB Director and I annually update the Administration's research and development (R&D) priorities, with input from both the President's Council of Advisors on Science and Technology (PCAST) and the National Science and Technology Council (NSTC). We also emphasize improving management and performance to maintain excellence and leadership in science and technology. This takes the form of an official joint memorandum from us to the heads of the executive departments and agencies. The FY 2009 R&D Priorities memo (below):

- **highlights the President's American Competitiveness Initiative;**
- **provides general guidance for setting priorities for agency R&D programs;**
- **identifies interagency R&D efforts that should receive special focus in agency budget requests; and**
- **reiterates the R&D Investment Criteria that agencies should use to improve investment, and for decisions about and management of their R&D programs.**

Subsequent to this formal transmission of the Administration's R&D priorities and the ongoing, continuous consultation and coordination with individual agencies and multiagency initiatives regarding specific programs, projects and activities, at the OMB Director's request, I review the formal agency budgets submitted in September, consult, discuss and make recommendations to OMB regarding such, and participate in the formal Director's Reviews and Passback process each Fall.

Executive Office of the President
Office of Management and Budget

Executive Office of the President
Office of Science and Technology Policy

August 14, 2007

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: JOHN H. MARBURGER, III John Marburger
DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

STEPHEN S. MCMILLIN Steph S. McMillin
ACTING DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

SUBJECT: FY 2009 Administration Research and Development Budget Priorities

We have updated the Administration's research and development (R&D) priorities, which reflect input from both the President's Council of Advisors on Science and Technology (PCAST) and the National Science and Technology Council (NSTC). We also emphasize improving management and performance to maintain excellence and leadership in science and technology. The sections that follow:

- highlight the President's American Competitiveness Initiative;
- provide general guidance for setting priorities for agency R&D programs;
- identify interagency R&D efforts that should receive special focus in agency budget requests;
- reiterate the R&D Investment Criteria that agencies should use to improve investment, and for decisions about and management of their R&D programs.

Presidential Priority: American Competitiveness Initiative

The President is committed to the success of the American Competitiveness Initiative (ACI) announced in his 2006 State of the Union address. The ACI doubles investment over 10 years in key Federal agencies supporting basic research in the physical sciences and engineering. This innovation-enabling research includes high-leverage areas that develop and advance knowledge and technologies used by scientists in nearly every other field. President Bush has successfully begun the doubling path for the National Science Foundation, the Department of Energy's Office of Science, and the Department of Commerce's National Institute of Standards and Technology core activities with an aggregate 17 percent increase in the first two years of the Initiative. To continue the doubling, these agencies should propose increases in FY 2009 that meet scheduled, ongoing facilities needs and provide for unique, high-value research opportunities. These proposals should be consistent with published out-year budget plans. We will evaluate the three requests together to determine final individual agency allocations. In addition to the doubling effort at these three agencies, real increases (above inflation) in the high-leverage basic research of the Department of Defense should be a significant priority.

General R&D Program Guidance

Agencies are expected to conduct programs in accordance with the highest standards of ethical and scientific integrity and to have clear principles, guidelines and/or policies on issues such as scientific openness, scientific misconduct, conflict of interest, protection of privacy, and the appropriate treatment of human subjects.

Careful attention to funding priorities and wise choices are required due to the combination of finite resources, the commitment to the American Competitiveness Initiative, and a multitude of new research opportunities. Agencies must evaluate existing programs and, wherever possible, consider them for modification, redirection, reduction or termination, in keeping with national needs and priorities. New programs have to be justified with rigorous analysis demonstrating their merit, quality, importance and consistency with national priorities. Agencies may propose new, high-priority activities, but these requests should identify potential offsets by elimination or reductions in less effective or lower priority programs, or programs where Federal involvement is no longer needed or appropriate.

In general, the Administration favors Federal agency R&D investments that:

- advance fundamental scientific discovery to improve future quality of life;
- support high-leverage basic research to spur technological innovation, economic competitiveness and new job growth;
- strengthen science, mathematics and engineering education based on the recommendations of the Academic Competitiveness Council and the National Math Panel to ensure a scientifically literate population and a supply of qualified technical personnel commensurate with national need;
- enable potentially high-payoff activities that require a Federal presence to attain long-term national goals, especially national security, energy independence, and a next-generation air transportation system;
- sustain specifically authorized agency missions (e.g., scientific discovery in NASA) and user facilities that support the authorized missions of other agencies;
- enhance the health of our Nation's people to reduce the burden of illness and increase productivity while respecting the inherent dignity and value of every human life;
- improve our ability to understand and respond to climate change and other global environmental issues and natural disasters through better observation, data, analysis, models, and basic and social science research;
- maximize the efficiency and effectiveness of the science and technology (S&T) enterprise through expansion of competitive, merit-based peer-review processes;
- phase out programs that are only marginally productive or are not important to an agency's mission; and
- encourage interdisciplinary research efforts on complex scientific frontiers and strengthen international partnerships to accelerate the progress of science across borders.

Interagency R&D Priorities

While some priority R&D areas fall mainly within the purview of a single agency, such as the President's space exploration vision at the National Aeronautics and Space Administration and Advanced Energy Initiative at the Department of Energy, other areas require strong interagency coordination. The following interagency R&D priorities should receive special focus in agency budget requests as relevant and appropriate to an agency's mission. If an agency receives funding for these activities, it should maximize planning and coordination through participation in applicable interagency coordination groups, especially the NSTC, to produce:

1) a clear and concise definition of program activities and priorities within the overall priority area;
2) an inventory of the programs in the baseline budget;
3) agency trade-offs that will provide the resources to help produce a coordinated, cross-agency program with greater impact than that of the individual activities; and
4) an interagency implementation plan.

Homeland Security and National Defense

The Nation's science and technology enterprise is a key asset to protecting the homeland and enabling national defense. Emphasis should be placed on agency research efforts in the following two areas:

> *Defense against the threat of a domestic nuclear event.* Development of transformational capabilities for the stand-off detection of nuclear materials must proceed as rapidly as possible. Emphasis is needed on R&D to better understand and mitigate the social and economic effects of a domestic nuclear explosion, including better tools to treat the injured and means for rapidly assessing damage to critical infrastructure and developing recovery options.
>
> *Biometrics.* Rapid, reliable and accurate biometric-based recognition of individuals is necessary for successful homeland security, counterterrorism, border control, law enforcement, e-commerce and e-government, and identity theft prevention. As directed by the National Security Council's Deputies Committee, agencies are to place emphasis on the priorities outlined in *The National Biometrics Challenge* and the resulting agenda developed by the NSTC Subcommittee on Biometrics and Identity Management. This will advance systems, methods and tools to achieve real-time, verifiable, interoperable, and privacy-protecting root identification. Each agency's plans to fulfill their portion of the agenda, and planned coordination with other agencies, should be highlighted in their budget requests.

Continue R&D efforts that support the development of:

- capabilities to counter the domestic threat from improvised explosive devices as emphasized in Homeland Security Presidential Directive 19;
- common decision support tools for response and coordination that integrate information from across domains and are applicable to various hazard scenarios including natural disasters, terrorist attack or disease outbreak;

- sampling and decontamination methodologies and tools for remediation of chemical, biological, radiological, and nuclear incidents including development of scientifically derived protective action guidelines;
- integrated predictive modeling capabilities for potential hazards and the basic science and data collection required to support these predictive capabilities;
- standardized, rapid, reliable and cost-effective detection systems and broad spectrum treatments to counter the threat of engineered biological weapons and emerging infectious diseases; and
- new methods to address the natural or intentional introduction of agricultural threats and the associated threats to human health, including new methods for detection, prevention, and characterization of high-consequence agents in the food and water supply.

Energy and Climate Change Technology

Within the context of the R&D investment criteria, energy R&D should support progress in two interconnected areas: energy security and greenhouse gas emission reduction. Priority should be put on eliminating scientific and technical barriers that limit the advancement of renewable, zero emission, and alternative energy sources. Agencies should align their R&D portfolios to achieve the goals put forth by the President, specifically: 1) to reduce U.S. gasoline consumption by 20 percent over the next ten years, compared to projections; and 2) to continue to advance the development of advanced energy technologies that cost-effectively reduce greenhouse gas emissions, especially basic research targeting scientific and technical breakthroughs in such areas as zero carbon emissions coal and carbon sequestration processes, nuclear energy, energy storage, solar energy, and hydrogen fuel cell technologies. Agencies should coordinate their R&D efforts through the Climate Change Technology Program (CCTP) to cost-effectively maximize greenhouse gas reductions across the overall portfolio of energy technologies to avoid duplication and should work with CCTP to quantifiably estimate the greenhouse gas benefits of their efforts. Trade-offs should be made as necessary to ensure success in areas identified to have the most promise and should enhance the integration of basic and applied research efforts.

To accelerate development of more efficient biofuels conversion technologies, agencies should:
- focus on fundamental research needs including optimized crops and cellulosic materials, material collection and pretreatment methods, and biorefinery processes, and
- investigate technologies and methods to mitigate potential environmental impacts associated with the increased supply, distribution, acquisition and use of biofuels.

Advanced Networking and Information Technology

The PCAST will be completing its comprehensive review of the interagency Networking and Information Technology R&D (NITRD) program by summer 2007. Agencies should consider the recommendations in the PCAST report when prioritizing investments in NITRD topics.

Investments in advanced networking R&D should focus on research in the foundations, design, management, security, and usability of future computing and communications networks to help sustain the Nation's military, scientific, economic, and technological preeminence. Specifically, agencies should continue their current active coordination and prioritization to complete the *Federal Plan for Advanced Networking R&D* to inform and guide their budget requests in this priority area.

Agencies should also prioritize implementation of the Federal Plan for Cyber Security and Information Assurance (CSIA) R&D. CSIA R&D should address any mission-relevant gaps identified in the Federal Plan; and should emphasize coordination, leveraging the efforts of all agencies and, where appropriate, use of coordinated multi-agency investments.

Agencies should continue to advance and coordinate investments in high-end computing. High-end computing should be increasingly used to support research for transformational solutions to complex problems in energy, climate and weather, human health, new materials and national security.

Agencies supporting R&D in these and other on-going components of the NITRD program are expected to participate in interagency planning through the NSTC to help prioritize future investments.

National Nanotechnology Initiative (NNI)

Robust Federal investment in the agency programs that make up the NNI will expedite realization of the potential of nanotechnology to address national priorities in areas such as energy, security, healthcare, and the environment and maintains U.S. scientific and technological leadership in this field.

Agencies should strengthen interagency coordination of and support research on potential risks to human health and the environment, consistent with the NSTC's 2006 report, *EHS Research Needs for Engineered Nanoscale Materials*.

More broadly, the NNI should support both basic and applied R&D in nanoscience, develop instrumentation and methods for nanoscale characterization and metrology, and disseminate new technical capabilities to help industry advance nanofabrication and nanomanufacturing.

Nanoscale research offers a natural bridge to collaboration between the life and physical sciences; therefore, agencies are encouraged to use approaches that accelerate interdisciplinary and interagency collaboration. Agencies are encouraged to participate in activities such as joint programs utilizing shared resources or leveraging complementary assets, as well as support for interdisciplinary activities at centers and user facilities.

Understanding Complex Biological Systems

Agencies should target research on a deeper understanding of complex biological systems through multi-disciplinary collaborations aimed at developing new and improved measurement and management tools to provide valid data that can be compared across laboratories and platforms.

Access to new biotechnological tools and increasing amounts of genetic sequence data opens new avenues for research into the functional implications of gene expression. Agencies should continue to pursue the development of new diagnostic and therapeutic applications targeted toward specific diseases and conditions, including ultimately those that are personalized based on the needs and genetic make-up of individuals.

At the same time, rapidly developing methods and capabilities within the behavioral and social sciences are enhancing our knowledge of organisms and larger systems and providing greater insight into the relationship between biological, physiological and cultural influences on human behavior and decision-making.

Agencies should focus research at the:
- cellular/sub-cellular and the organism/population/community levels; and
- interface of the life, physical and computational sciences.

In particular, this research is relevant to the prevention and treatment of infectious disease, and tc inherently complex and wide-ranging issues such as obesity and emergency preparedness and response.

Environment

Climate science investments are critical to improving our understanding of global climate variability and change, providing the basis for sound decision-making, and enabling the development of new, cleaner technologies. So as to better inform policy, agencies should continue to make investments to improve our ability to observe, model, assess, and adapt to impacts of climate change, particularly on a regional scale, and to assure the availability of critical long-term climate data. Agencies should continue supporting the goals of the 2003 *Strategic Plan for the U.S. Climate Change Science Program*; and align climate science investments with the specific priorities articulated in the Climate Change Science Program FY 2009 Interagency Implementation Priorities memo.

The NSTC Joint Subcommittee on Ocean Science and Technology released its strategic plan, *Charting the Course for Ocean Science in the United States: An Ocean Research Priorities Plan and Implementation Strategy* in 2007. Agencies should address the priorities in the Strategy to better inform and, therefore, improve our interactions with and stewardship of our valued ocean resources. In particular, agencies should give high priority to these four near term opportunities:
- forecasting the response of coastal ecosystems to persistent forcing and extreme events
- comparative analysis of marine ecosystem organization
- sensors for marine ecosystems
- assessing Atlantic Meridional Overturning Circulation variability, which has implications for rapid climate change

Agencies are also encouraged to align programs with *A Strategy for Federal Science and Technology to Support U.S. Water Availability and Quality* because of the importance of fresh water supplies to human health, environmental quality, and economic prosperity.

Global Earth observations play an important role in supporting research in a wide range of sciences important for society, and especially for the environmental priorities listed above. Agencies should refer to the *U.S. Strategic Plan for an Integrated Earth Observations System* and *Development of the U.S. Integrated Earth Observation System: Progress and Recommendations for the Way Forward* for guidance in contributing to these efforts. Agencies need to place a greater emphasis on coordinating their Earth observation activities. To ensure coordinated, long-term collection of critical land imaging data, agencies should respond to the recommendations of the Future of Land Imaging report in their budget requests.

Next Generation Air Transportation System

If conducting R&D related to the Nation's air transportation system, agencies should align their R&D efforts with the Next Generation Air Transportation System objectives to the maximum extent possible.

Federal Scientific Collections

Federal scientific collections play an important role in public health and safety, homeland security, trade and economic development, medical research, and environmental monitoring. Agencies are developing a coordinated strategic plan to identify, maintain and use Federal collections of physical objects and to further collections research. Agencies should participate in the finalization of this plan and in its subsequent implementation.

Science of Science Policy

Agencies should continue to participate in the interagency process to promote and coordinate individual and collaborative actions needed to develop the "science of science policy" for better assessing the impact of R&D investments, defining appropriate metrics for measuring this impact, understanding the effect of the globalization of science and technology, and improving the basis and capacity of Federal science policy decisions to achieve national goals.

Research and Development Investment Criteria

The President's Management Agenda directs agencies to use the R&D investment criteria (relevance, quality, and performance) to improve investment decisions for and management of their R&D programs. Industry-relevant applied R&D must meet additional criteria. The specific activities programs should undertake to demonstrate fulfillment of the R&D investment criteria are described in a previous year's memorandum, which is available at: http://www.whitehouse.gov/omb/memoranda/m03-15.pdf

Many of these specific activities have been incorporated into the Program Assessment Rating Tool (PART). Agencies should use the criteria as broad guidelines that apply at all levels of Federally funded R&D efforts and the PART as the instrument to periodically evaluate fulfillment of the criteria at the program level.

The R&D investment criteria continue to:

- provide tools for programs, agencies, and policy makers to select, plan, and manage R&D programs effectively, to increase the productivity of the Federal R&D portfolio and the return on taxpayer investment;
- help convey the Administration's expectations for proper program management;
- set standards for information to be monitored and provided in program plans and budget justifications; and
- ultimately improve public understanding of the potential benefits and effectiveness of the federal investment in R&D.

Background

Congress established OSTP with a broad mandate to advise the President and others within the Executive Office of the President on science and technology in 1976. The Act authorizes OSTP to lead interagency effort to develop sound science and technology policies and budgets. It is not clear, however, how or to what extent OSTP's recommendations on the appropriate level of investments in science and technology are incorporated in the annual budgets presented to Congress. Is the R&D budget presented by the President his or Director Nussle's?

Answer: It is the President's Federal R&D budget based on and informed by the advice and counsel the President receives from me, the OMB Director, and other members of his senior staff and Cabinet through the process described above.

Follow-on Questions:

- Does your office review each of the Agency's budget requests when they are submitted to OMB?

Answer: Yes, either as provided by OMB staff or when sent directly by the requesting department or agency.

- Are you seated with the OMB Budget Director during his review of those submissions and the recommendations of his program divisions?

Answer: Yes, at his invitation with other senior staff of the Executive Office of the President.

- To what extent do you propose both broad and agency-specific program funding levels as part of OMB's passback to the agencies?

Answer: Both as appropriate to be consistent with the Administration's Federal R&D policies, priorities, missions and goals.

- How does your office reconcile differences between the levels proposed by OMB in the agencies' budgets and those recommended by your office?

Answer: Through both informal consultation, discussion, joint evaluation and negotiation between OSTP and OMB staff, and other EOP and agency staff as appropriate, and when necessary, through formal presentation, discussion, deliberation and decision by the OMB Director, EOP principals, Cabinet officials and the President.

- What investments in science and technology did you recommend to OMB that are not included in the FY 2009 budget request made by the President?

Answer: My recommendations are fully incorporated in the President's 2009 Budget and I whole-heartedly and enthusiastically endorse and recommend its adoption and implementation as soon as possible to restore our mutual innovation and competitiveness goals for America.

- How does your office ensure that OMB's overall recommendation for science and technology across all government agencies is balanced?

Answer: By thoroughly reviewing, and where necessary adjusting, the individual agencies S&T programs to ensure they sufficiently and effectively contribute to fulfillment of the Administration's Federal R&D priorities and working through and in the process described above for a unified, coordinated and complete R&D investment to achieve the missions and goals of the Nation.

- Do you believe the FY 2009 budget for research and development is both balanced and sound?

Answer: Yes, absolutely.

- Where, in your professional opinion, does the FY 2009 budget fall short on investments in science, research and technology?

Answer: The FY 2009 Budget only falls short if not adopted. Overall, Federal R&D in the 2009 Budget is $147 billion, $4 billion more than FY 2008. That represents one out of every seven dollars requested by the President in the discretionary budget. This total exceeds the Fiscal Year 2001 amount by $56 billion and represents growth of 61 percent since then. Over these eight years, the cumulative Federal R&D investment will total over $1 trillion.

The growth in non-defense R&D is even more dramatic in the 2009 Budget. The President is seeking a six percent increase in this category. By comparison, the remainder of the non-security discretionary budget is up less than 1 percent. With the 2009 Budget, real growth in outlays for the conduct of non-defense R&D, with the effect of inflation factored out, is up 31 percent in eight years. Real non-defense R&D growth for the previous eight years was 11 percent. The President's commitment to the government's R&D enterprise is strong, and the advancement of science remains among his top budget priorities.

AMERICA COMPETES ACT AND THE PRESIDENT'S FY 2009 BUDGET REQUEST

Dr. Marburger, the President's budget for programs authorized by COMPETES falls short by almost $720 million in fiscal year 2009. What is the impact on science and engineering research and the Nation of not fully funding the research activities that are part of the COMPETES Act and the President's ACI?

Answer:

FY08 OMNIBUS ACI RESEARCH CUT IMPACTS

DoE Office of Science: Increased funding provided in President's ACI request was cut by 91 percent, or $548 million, after removing earmarks

- Impact on Scientists, Engineers and Education
    - Layoffs of about 210 Ph.D.'s and 40 graduate students at National Labs.
    - Roughly, an additional 520 Ph.D.'s and 240 graduate students will not be hired or supported at National Labs because the request to fund competitiveness was denied.
    - Eliminates funding proposed for 700 peer-reviewed energy research grants related to a secure energy future, hydrogen storage, solar energy, superconductivity, advanced nuclear energy systems, etc.
- Impact on DOE Science:
    - Zeroes U.S. contribution to ITER, the largest, highest visibility international collaboration in science, designed to be an essential step toward practical carbon-free power generation from nuclear fusion and major long-term solution to climate change
    - Reduces operations by 20% of all light and neutron facilities, and nanoscale science research centers, critical to discovery in energy, nanotechnology, biotechnology, health, and materials science
    - Delays completing instruments at the Spallation Neutron Source and Linear Coherent Light Source, jeopardizing U.S. global competitiveness in materials S&T in energy, telecommunications, manufacturing, transportation, information technology, biotechnology, and health
    - Slows construction of the National Synchrotron Light Source-II, preventing capability of new X-ray measurements that will enable new discovery and innovation
    - Reduces International Linear Collider funding by 75%, undermining the credibility of the U.S. as a potential site and particle physics leader, and severely damaging the high energy physics program
    - Prevents basic research essential to advanced nuclear power systems and reprocessing

NSF: Increased funding provided in the President's ACI request was cut by 77 percent, or $397 million

- Impact on Scientists, Engineers and Education
  - 230 fewer student scientists supported by Graduate Research Fellowship program.
  - 1,000 fewer basic research projects
- Impact on NSF Science:
  - Nanotechnology research cut $12 million below FY 2007
  - Supercomputing and advanced networking cut $64 million below President's request.
  - Climate Change Science Program cut below FY 2007.

NIST: Increased lab funding provided in the President's ACI request was cut by 65 percent, or $67 million, after removing earmarks

- Impact on Scientists, Engineers and Education
  - Removes 300 positions for new scientists and engineers working at NIST and throughout the nation.
- Impact on NIST Science:
  - Eliminates proposed funding for advanced measurement and characterization tools needed by industry to fully and safely exploit the tremendous potential of nanotechnology, which will impact in materials, electronics, pharmaceuticals, the chemical industry, aerospace, and healthcare
  - Significantly cuts proposed funding for quantum computing research that will fundamentally alter a number of fields including secure communications (relevant to both the national security and financial communities) and supercomputing
  - Curtails improvement of the accuracy of climate change predictions, providing policymakers with accurate information about the advantages and consequences of various policy options
  - Denies proposed increases for development of improved building standards, codes, and hazard and forecasting metrics for our national infrastructure to proactively reduce disaster-imposed losses (estimated at $52 billion a year from hurricanes, tornadoes, storm surges, fires, earthquakes, and tsunamis)

Background

The America COMPETES Act responded to concerns that the United States may not be able to compete economically with other nations in the future due to insufficient investment today in science and technology research and science, technology, engineering, and mathematics (STEM) education and workforce development. The Act was signed into law on August 9, 2007. A similar concern led President Bush to announce the American Competitiveness Initiative (ACI) in January 2006. The Act authorizes an increase in the nation's investment in science and engineering research and in STEM education from kindergarten to graduate school and postdoctoral education.

Follow-on Question:

- Which of the America COMPETES Act programs does the Administration support and which does it oppose and why?

Answer: President Bush's statement upon signing the America COMPETES Act above.

THE WHITE HOUSE
PRESIDENT
GEORGE W. BUSH

For Immediate Release
Office of the Press Secretary
August 9, 2007

President Bush on Signing America COMPETES Act

Today I signed into law H.R. 2272, the "America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act." This legislation shares many of the goals of my American Competitiveness Initiative (ACI). ACI is one of my most important domestic priorities because it provides a comprehensive strategy to help keep America the most innovative Nation in the world by strengthening our scientific education and research, improving our technological enterprise, and providing 21st century job training.

Since I announced ACI in January 2006, Congress has risen to the competitiveness challenge in a bipartisan way. House and Senate appropriators started the funding for ACI basic research programs in fiscal year 2007, and so far in this year's appropriations process they are fully funding my fiscal year 2008 budget request for the National Science Foundation, the Office of Science in the Department of Energy, and the National Institute of Standards and Technology at the Department of Commerce.

This bipartisan spirit of cooperation continues with the legislation I signed. This legislation supports our efforts to double funding for basic research in the physical sciences. And the bill authorizes most of the education programs I called for in ACI, including the Math Now proposal that improves instruction in mathematics and the Advanced Placement program that increases the number of teachers and students participating in AP and International Baccalaureate classes.

I am, however, disappointed that Congress failed to authorize my Adjunct Teacher Corps program to encourage math and science professionals to teach in our schools. I am also disappointed that the legislation includes excessive authorizations and expansion of government. In total, the bill creates over 30 new programs that are mostly duplicative or counterproductive -- including a new Department of Energy agency to fund late-stage technology development more appropriately left to the private sector -- and also provides excessive authorizations for existing programs. These new programs, additional requirements and reports, and excessive authorizations will divert resources and focus from priority activities aimed at strengthening the basic research that has given our Nation such a competitive advantage in the world economy. Accordingly, I will request funding in my 2009 Budget for those authorizations that support the focused priorities of the ACI, but will not propose excessive or duplicative funding based on authorizations in this bill.

While this legislation includes many unnecessary and misguided programs, in many important ways it heeds my call to action of nearly two years ago to take steps to ensure the ongoing competitiveness of our Nation. Congress, however, still has more work to do to improve our Nation's competitiveness. In addition to giving priority to full ACI funding in this year's appropriations bills, I call on Congress to complete work on the remaining components of ACI, including modernizing and making permanent the research and development tax credit, authorizing the Adjunct Teacher Corps program, and increasing our ability to attract and retain the best and brightest high-skilled workers from around the world.

I thank Members of both parties in Congress who worked on this legislation, and I appreciate the willingness of Members to remove or otherwise address several of the Administration's serious concerns associated with this legislation. I will continue to work with the Congress to ensure that we keep America competitive through appropriate and strong support for science and technology.

# # #

Comparison of America COMPETES Act of 2007 with the 2008 Omnibus and the 2009 President's Budget

($ in millions)

	FY 2008				FY 2009			
	FY08 COMPETES	FY08 OMNIBUS	Omnibus vs. COMPETES	% of COMPETES funded in Omnibus[1]	FY09 COMPETES	FY09 Budget	Budget vs. COMPETES	% of COMPETES funded in Budget[1]
Title 1, Sec 1002, Study on Barriers to Innovation	1	0	-1		0	0	0	
Title 3, Sec 3001-A-1, Laboratory Activities, NIST	502	446	-56	89	542	535	-7	99
Title 3, Sec 3001-A-2, Construction and Maintenance, NIST	151	160	9	106	86	99	13	115
Title 3, Sec 3001-B-1, Industrial Technology Services, MEP	110	90	-20	82	122	4	-118	3
Title 3, Sec 3001-B-1, Industrial Technology Services, TIP	100	46	-54	46	132	0	-132	0
NIST Subtotal	**863**	**742**	**-121**	**85**	**882**	**638**	**-244**	**71**
Title 5, Sec 3171-I, DOE MSE Pilot Program	14	0	-14	0	23	0	-23	0
Title 5, Sec 3175-F, DOE Experimental Based Learning Ops.	3	0	-3	0	8	0	-8	0
Title 5, Sec 3185-F, DOE Summer Institutes[2]	15	2	-13	13	20	6	-14	30
Title 5, Sec 3181, National Energy Education Development	1	0	-1	0	"as needed"	0		
Title 5, Sec 5004-F-1, Nuclear Sci Program Expansion Grants	4	0	-4	0	7	0	-7	0
Title 5, Sec 5004-F-2, Nuclear Sci Competitiveness Grants	3	0	-3	0	8	0	-8	0
Title 5, Sec 5005-F-1, Hydrocarbon Systems Sci Prog. Grants	4	0	-4	0	7	0	-7	0
Title 5, Sec 5005-F-2, Hydrocarbon Systems Sci Competitiveness Grants	3	0	-3	0	8	0	-8	0
Title 5, Sec 5006-H, DOE Early Career Awards	25	9	-16	36	25	10	-15	40
Title 5, Sec 5007, DOE Basic Research extension to 2010	4,586	3,973	-613	87	5,200	4,722	-478	91
Title 5, Sec 5008, Discovery Sci and Engineering Innov. Inst's[3]	10	0	-10	0	10	0	-10	0
Title 5, Sec 5009, PACE Fellowships	8	18	10.5	240	12	19	7	158
Title 5, Sec 5011, Distinguished Scientist Program	15	0	-15	0	20	0	-20	0
Title 5, Sec 5012, ARPA-E[4]	300	0	-300	0	"such sums"	0		
DoE Subtotal	**4,994**	**4,002**	**-992**	**80**	**5,641**	**4,757**	**-884**	**84**
Title 6, Sec 6113, Programs for Baccalaureates' in Sci/Tech	151	1	-150	1	151	0	-151	0
Title 6, Sec 6114, Programs for Masters in Sci/Tech	125	1	-124	1	125	0	-125	0
Title 6, Sec 6123, AP and IB programs[4]	75	44	-31	59	"such sums"	70		
Title 6, Sec 6131, Promising Practices	1	0	-1	0	--	--		
Title 6, Sec 6201, Math Now for Elem/Middle Sch Programs[4]	95	0	-95	0	"such sums"	95		
Title 6, Sec 6202, Summer Term Education Marks	"such sums"	0			"such sums"	0		
Title 6, Sec 6203, Math skills for secondary school students	95	0	-95	0	95	0	-95	0
Title 6, Sec 6304, Foreign Language Partnership Program	26	0	-26	0	"such sums"	24		
Title 6, Sec 6401, Alignment of education programs	120	0	-120	0	"such sums"	0		
Title 6, Sec 6502, Math and Science Partnership Bonus Grants	"such sums"	0			"such sums"	0		
ED Subtotal	**690**	**46**	**-644**	**7**	**689**	**189**	**-500**	**27**
Title 7, Sec 7002, National Science Foundation	6,600	6,032	-568	91	7,326	6,854	-472	94
Research and Related Activities	5,156	4,821	-335	94	5,742	5,594	-148	97
Major Research Instrumentation Program	115	94	-21	82	123	115	-8	93
Faculty Early Career Development Program	166	168	2	101	184	182	-2	99
Research Experiences for Undergrads Prog.	62	58	-4	94	69	62	-7	90
Experimental Program to Stimulate Competitive Research	120	111	-9	93	133	114	-20	85
Integrative Graduate Education and Research Traineeship program	47	38	-9	80	53	39	-14	74
Graduate Research Fellowship Program	9	8	-1	90	10	8	-2	81
Professional Sci Masters degree program (Sec 7034)	10	0	-10	0	12	0	-12	0
Education and Human Resources	896	726	-170	81	995	790	-205	79
Math/Sci partnerships under Sec. 9, NSF Auth Act 2002	100	48	-52	48	111	51	-60	46
Robert Noyce Scholarship, NSF Act Sec 10	90	11	-79	12	115	12	-103	10
Sci/Math/Eng/Tech Talent expansion program, NSF Act	40	30	-10	74	50	30	-20	59
Advanced Tech. Education Program (Sci-Ad. Tech Act of 1992)	52	52	-0.4	99	58	52	-6	89
Integrative Graduate Education and Research Traineeship program	27	25	-2	93	30	25	-5	83
Graduate Research Fellowship Program	97	88	-9	91	107	117	10	109
Research Equipment and Facilities Construction	245	221	-24	90	260	146	-114	56
Agency Operations and Award Management	286	282	-4	99	310	305	-5	98
Office of the National Science Board	4	4	-0.1	98	4	4	0	98
Office of the Inspector General	12	11	-1	93	13	13	0	100
Title 7, Sec 7024, Laboratory Science Pilot Program[4]	5	0	-5	0	"such sums"	0		
NSF Subtotal	**6,605**	**6,032**	**-573**	**91**	**7,331**	**6,854**	**-477**	**93**
Title 8, Sec 8005, Study of the Provision of Online Degree Programs	"such sums"	3			--	--	--	
TOTAL	13,152	10,822	-2,330	82.1	14,546	12,438	-2,108	85.3
TOTAL (without Dept. of Ed.)	12,464	10,776	-1,688	86	13,857	12,249	-1,608	88

▨ Denotes American Competitiveness Initiative programs. Omnibus funding of ACI activities includes $124 million and $83 million of earmarks and unrequested grants at DoE and NIST, respectively.

[1] Percentages exclude amounts in excess of authorized levels for individual programs.

[2] Funded through DoE Academies Creating Teacher Scientists Program.

[3] Though not included in table, total Budget funding for DoE research center partnerships similar to those in Section 5008--Energy Frontier Research Centers, Bioenergy Research Centers, and SciDAC Institutes--is $183 million.

[4] When applicable, authorized levels of "such sums" are assumed to be equal to the prior year amount.

- Why is it your opinion that the behavioral and social sciences and education programs should not be part of the ACI? Do you not believe these programs play a role in the science and technology posture of the United States?

Answer: (a) The behavioral and social sciences are a part of the ACI. (b) The behavioral and social sciences do play an important role in the science and technology posture of the United States.

- Significant increases are slated for the mathematical and physical sciences and science and engineering sciences (+20 percent) at NSF, while other sciences such as biological sciences (+10 percent) and behavioral and social sciences (+8.5 percent) see much smaller increases. Does this represent NSF disinvesting in these sciences over the long-term? When will this trend change?

Answer: (a) No. (b) The ACI is a ten year plan.

- I understand that the National Science and Technology Council of OSTP is soon to release a report on the grand challenges of the social, behavioral and economic sciences disciplines. What are the findings of this report and do they suggest that a revision in the proportional increases between the science directorates at NSF are necessary both in the FY 2009 budget request and in long-term planning?

Answer: I will be pleased to provide a copy of this plan immediately upon completion.

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

Dr. Marburger, once again, the Administration has sent us a NIST budget that is little more than a shell game. Instead of proposing real increases for NIST programs as a whole, the budget eliminates the MEP and TIP programs and uses the savings to pay for lab funding and construction. The budget directly contradicts the priorities set by Congress in the COMPETES Act, which authorized balanced investments in NIST's internal and external programs.

- Instead of giving us ideological statements, will you tell us what were the specific data and criteria that were used to ignore the priorities of the COMPETES Act?

Answer: Please refer to President Bush's statement upon signing the America COMPETES Act above.

Background

According to NIST studies, the MEP has proven short-term (one-year) returns of at least 10 to 1 and the ATP had better than 8 to 1 return. Returns on basic research may be high, but they are long-term. COMPETES authorizes balanced investments in both basic research and technology development programs because we need both short-term and long-term support for US competitiveness. The budget request implies that either (a) the Administration is not interested in short-term competitiveness, or (b) it opposes technology development programs because of ideology, not objective dollar value.

Follow-on Question:

- This Committee would be very interested if you would share with us with the data and your analysis you used in making your judgment. Will you supply the Committee with the specific data and studies that you used to vitiate the priorities in COMPETES?

Answer: The President's Budget addresses the need to prioritize and fund the most important, highest-leverage activities with available resources. As stated throughout OSTP budget documents (http://www.ostp.gov/galleries/press_release_files/FY2009RDFinal.pdf), the highest priority is long-term basic research in the physical sciences as identified through the President's American Competitiveness Initiative. At NIST, the highest budget priority is NIST's core research programs. The judgment that informed this prioritization represents not only the opinion of the Administration but also the business and academic community as identified through numerous reports issued from 2004 through 2007 (for example, see Council on Competitiveness's "*Innovate America*", National Academy of Sciences' "*Rising Above the Gathering Storm*," and Business Roundtable's "*Tapping America's Potential*". In contrast to basic research which provides nationwide and economy-wide benefits, the MEP program provides

benefits that largely accrue to the firms that receive the consulting services. The Administration believes that the firms therefore generally have the incentive and ability to cover more of these costs.

- According to NIST budget documents, NIST selects initiatives that are "highly leveraged". NIST's most leveraged investments are the MEP program, which attracts two-thirds of its funding from non-federal sources, and the new Technology Innovation Program, which requires 50% cost sharing on all of its grants. If NIST is choosing highly-leveraged initiatives, why is the Administration proposing to eliminate the two most-highly leveraged NIST programs?

Answer: "The short answer is it is a prioritization. I will say that I feel very strongly that the basic research part of NIST, their core operations are the most important things, and that they are underfunded. I want to be clear about that." "And I don't want to suggest that these are bad programs or that they are failing or that they are poorly managed, but only in the grand scheme of things, if we have money that we can spend on NIST, I would like to see NIST grow its much more high-leverage operations first and let these others sort of rest until we can get the core up." (February 26 Hearing Transcript, page 42) "This Administration believes that the private sector should be investing in the types of activities that the MEP and ATP program historically had been funding. So I want to acknowledge that the difference of opinion about the appropriate work to be done in private versus public sector does exist and does influence the decision about how to fund them". (February 26 Hearing Transcript page 43)

MANUFACTURING EXTENSION PARTNERSHIP (MEP)

Dr. Marburger, since President Bush took office, this Nation has lost 3.4 million manufacturing jobs -- high-skill, high-wage jobs that are the backbone of communities across the country. Since the budget proposes zeroing out federal support for the MEP program, what priority does the Administration give to our manufacturing base and small- and medium-sized manufacturers?

Answer: U.S. manufacturers are a critical element of today's economy, and their ability to remain competitive will continue to be tied strongly to technological innovation. This Budget's focus on priority ACI research will benefit America's manufacturers by accelerating advances in fundamental science that can be exploited by industry. In addition, the Small Business Innovation Research and Small Business Technology Transfer Programs continue to emphasize manufacturing as a priority for small business support as directed by Executive Order 13329, signed by President Bush in 2004. The Administration has also supported and provided significant tax relief to benefit small manufacturers and other small businesses.

Background

NIST recently reported the results of a survey of manufacturers that used the MEP program in 2006. One year after using MEP services, these small manufacturers reported:

- 52,000 jobs created or retained;
- $6.8 billion in new or retained sales;
- $1.1 billion in cost savings; and
- Over $1.7 billion of private investment leveraged.

These results came from a $100 million program in federal funds – small investments in the scheme of the federal research and development budget. Because of results like these, the COMPETES included for MEP a ten-year doubling path, to help more small manufacturers across the country improve their productivity and create new jobs.

Follow-on Questions:

- What data or analysis was used by the Administration to conclude that the MEP centers can provide the same level of service to small and medium-size manufacturers without federal support?

Answer: The benefits noted above accrue largely to the firms receiving MEP services, and therefore provide the means and incentive for such firms to cover a larger share of the program's costs. As Federal support is eliminated, the level of service provided MEP centers will be commensurate with the demand for consulting

services and the benefits that accrue to firms from MEP. The Budget appropriately focuses NIST resources to the highest value basic research activities that provide benefits on a broad basis to industries and the economy as a whole.

- Last year the Director of NIST indicated that the federal government was an important partner in the MEP program as the Feds develop new services for MEP to offer in response to manufacturing needs. As you know, the federal government validates the quality of the MEP centers' performance and it focuses on small manufacturers. Was the former NIST director's assessment so wide of the mark to necessitate program termination?

Answer: The NIST Director's evaluation was not off the mark. However as stated the MEP program is not as high of leverage or as high of a priority as the aforementioned NIST core activities, as its benefits largely accrue to firms using the MEP services, which in turn have appropriate incentives to help cover the program's costs.

- Have program outcomes changed so dramatically in one year or has the state of manufacturing in the US improved to such a degree that MEP no longer needs federal support?

Answer: Please see answer immediately above.

TECHNOLOGY INNOVATION PROGRAM (TIP)

Dr. Marburger, please share with the Committee the Administration's rationale in eliminating funding for TIP and disregarding the state of private-sector funding for technology development?

Answer: "The short answer is it is a prioritization. I will say that I feel very strongly that the basic research part of NIST, their core operations are the most important things, and that they are underfunded. I want to be clear about that." "And I don't want to suggest that these are bad programs or that they are failing or that they are poorly managed, but only in the grand scheme of things, if we have money that we can spend on NIST, I would like to see NIST grow its much more high-leverage operations first and let these others sort of rest until we can get the core up." (February 26 Hearing Transcript page 42) "This Administration believes that the private sector should be investing in the types of activities that the MEP and ATP program historically had been funding. So I want to acknowledge that the difference of opinion about the appropriate work to be done in private versus public sector does exist and does influence the decision about how to fund them." (February 26 Hearing Transcript page 43)

Background

The Administration argues that TIP would subsidize activities that the private sector has the means and incentive to support. Early-stage venture capital in the US has moved away from high-risk, seed-stage investment. This argues for ATP, which has a vital role to play in the US response to global competition. In addition, NIST's own studies show that ATP recipients either would not have conducted the R&D or conducted it significantly slower absent ATP funding (this is important because time-to-market is a critical factor in success of technology products). ATP recipients also indicate that ATP funding was important in forming collaborations to pursue technology R&D.

NASA

Dr. Marburger, what actions have you taken to enhance NASA's contribution to promote innovation and U.S. economic competitiveness?

Answer: NASA has a long history of successful innovation in pursuit of its agency mission. With respect to supporting future NASA contributions regarding these issues, this Administration has sought to ensure that 1) NASA has appropriate policy direction regarding its future research and development activities in the space and aeronautics arenas; 2) its technology investments and development activities are being tailored to support these goals in a reasonable manner; and 3) NASA has sufficient and stable resources with which to pursue such programs. OSTP's role has been to work within the Administration's policy and budget development processes concerning NASA to support the formulation of these plans and priorities, and ultimately to help involved agencies and organizations achieve these objectives.

Background

The America COMPETES Act states that NASA should be participating fully in any interagency effort to promote innovation and economic competitiveness through near-term and long-term basic scientific and engineering research and development and in the promotion of science and mathematics education consistent with NASA's mission.

Follow-on Question:

- If American competitiveness requires increased funding for research at other federal agencies, for which the President's American Competitiveness Initiative proposes to double the research of several federal agencies, why does it not require increased funding for science at NASA (for which the FY 2009 budget request is less than the amount appropriated for FY 2008, even before adjusting for inflation)?

Answer: "The reason that NASA and NOAA aren't part of the doubling track, as it were, for the American Competitiveness Initiative is that – there are two reasons. The first one is that that they are more nearly adequately funded for the missions that they perform than these other parts of the science agency community; and secondly, that the direct product of their research is less relevant to long-term economic competitiveness and to the line of products that sustain the American economy and the likely future economy." (February 26 Hearing Transcript page 63)

BALANCING PRIORITIES WITHIN NASA

President Bush announced NASA's Vision for Space Exploration in 2004, and Congress endorsed the Vision's goals in the NASA Authorization Act of 2005, which needs to be reauthorized this year. The Vision focuses on completion of the space shuttle and space station programs, followed by human exploration of the Moon and eventually Mars. It places little emphasis on other NASA activities, such as unmanned science missions, aeronautics research, and education programs. What is the appropriate balance between Vision and non-Vision priorities at NASA?

Answer: With regard to an appropriate balance between Vision and non-Vision priorities, it would be difficult to define a specific percentage allocation between these activities that would be appropriate and meaningful irrespective of the year (and the circumstances at any given time). Major development efforts occur in phases entailing different amounts of funding at different points in time, while NASA mission directorates as a whole also have ebbs and flows in funding requirements depending upon how long current missions are lasting and mission development cycles. The important point is to provide sufficient funding to support robust NASA programs in both of these areas of priority, and then to manage and oversee these activities carefully as they proceed. The President's FY2009 budget request is consistent with this objective, calling for a total of $17.61 billion (a 2.9% increase over the FY2008 enacted level), with almost a third of this amount allocated to science activities. Our view is that this request reflects a strong commitment by the Administration both to the exploration vision and a vigorous NASA science program, while also seeking to reinforce the foundational R&D capabilities necessary for long-term technical excellence and success in aeronautics. Although NASA is facing a challenging array of tasks in coming years, the Administration believes that the FY2009 request provides sufficient funds to support these planned activities in a balanced and suitable manner.

Background

Given the lack of emphasis on unmanned science missions, aeronautics research and education programs, supporters of these other activities have expressed concern about the Vision's impact on their funding. As NASA budgets propose only modest increases in the aggregate, these programs get squeezed. Scientists have expressed concern that NASA's budget is not balanced appropriately – favoring human space flight activities as opposed to science and aeronautics research and development.

Of note, too, are surveys by the National Science Foundation which note that public support for increasing spending on scientific research (38%) is almost three times that for increasing spending on space exploration (14%).

Follow-on Questions:

- What are you doing to ensure that NASA achieves that balance?

Answer: OSTP coordinates extensively with OMB, other White House offices, and NASA in an effort to ensure that NASA's budget is consistent with program requirements and Presidential priorities across the range of NASA activities, while supporting sufficiently robust programs in priority areas such as human spaceflight, space and Earth science, and aeronautics. Throughout this process, OSTP also carefully reviews recommendations and analyses provided by non-governmental organizations (such as the National Research Council) regarding these programs and issues, in order that these valuable perspectives are also taken into account.

- How does NASA determine the balance in its budget between science, aeronautics, education, exploration, and human space flight programs?

Answer: In coordination with OMB, OSTP and other White House offices, NASA develops its budget proposals based upon a range of factors, including Presidential policy direction and priorities, relevant statutes, program goals and requirements, and advice and recommendations from non-governmental organizations (such as the National Research Council). Such factors inform the Administration's decision-making process as it sorts among often competing NASA priorities within current fiscal constraints, and these considerations are an important input in determining the appropriate funding amounts for various NASA activities. It is through balancing such factors that the Administration ultimately determines the allocation, or balance, among NASA's various directorates and programs in any given year.

- Does this balance need to be reconsidered in the context of both the reauthorization of NASA as well as the Committee's funding decisions?

Answer: OSTP believes that the FY2009 budget request for NASA addresses Administration priorities in this area in a reasonable and appropriate manner. As noted earlier, however, the current NASA funding allocation is neither static nor set in stone but rather will continue to evolve as needs and priorities change with time. The 2005 NASA Authorization Act, coupled with applicable Administration space policies, has provided a beneficial and appropriate framework for this balancing process, and a wholesale change to (or fundamental reconsideration of) this framework does not seem necessary or advisable at this time.

- In the past two months there have been discussions in the press about efforts to modify the Vision for Space Exploration. At what point in the implementation of the Vision would it be appropriate to make a mid-course correction?

Answer: It is a difficult to address the notion of a mid-course correction to the Vision for Space Exploration in the abstract, or in isolation from current U.S. interests or NASA program development status regarding space exploration. Much

progress now has been made in attaining the capabilities and goals directed in the Vision, supported by significant government and private sector investments and activities. Major mid-course changes in an endeavor as broad and far-reaching as the Vision almost certainly would result in significant disruptions to these activities and likely would result in scheduling delays, longer gaps in developing key architecture capabilities (such as those for human spaceflight), and potentially higher costs depending upon the nature of the change. Perhaps more importantly, OSTP believes that the step-by-step, sustainable, go-as-you-can-afford-to-pay exploration plan laid out in the Vision presents a sensible and practical path forward in terms of long term U.S. space exploration activities. In this regard, we simply do not consider a major mid-course change to be necessary so long as meaningful progress continues to be in achieving these important national goals.

- Have you analyzed the alternatives being discussed, such as exploring an asteroid rather than establishing a permanent base on the Moon? If so, what is your assessment of those alternatives?

Answer: OSTP is aware of the general outlines of several alternative exploration concepts but has not analyzed the full range of alternatives in detail. With regard to the notion of exploring an asteroid rather than pursuing extensive lunar surface activities (including NASA's current plan to establish a lunar research outpost), OSTP would not view such a plan as a viable or desirable alternative (capable of providing sustained benefits) over the long run. One key reason is that the Moon is the massive and relatively close to the Earth but substantially out of Earth's gravity well and therefore of great interest to deep space operations. It also is a significant source of material and resources for supporting such operations, and thus perhaps presents long-term commercial opportunities. If it is our intent to eventually conduct human spaceflight missions to Mars or other distant destinations beyond Low Earth Orbit, it is difficult to see how the nation can meaningfully do so without first taking full advantage of the benefits and resources provided by the Moon (including its unique attributes as a place for developing and testing technologies and capabilities). The Vision for Space Exploration explicitly acknowledges that reality by including lunar missions and activities as relatively near-term milestones. OSTP continues to believe that this is the proper and reasonable course for pursuing the fundamental goals and interests identified in the Vision.

NATIONAL SCIENCE AND TECHNOLOGY COUNCIL'S NATIONAL AERONUATICS RESEARCH AND DEVELOPMENT PLAN

In December 2006, the National Science and Technology Council issued a national aeronautics research and development (R&D) plan. The plan identifies specific near-term, mid-term, and long-term goals and objectives for the nation's aeronautics R&D effort, but it does not mention funding. Here are some of the plan's chapter headings:

- Mobility through the air is vital to economic stability, growth, and security as a nation.
- Aviation is vital to national security and homeland defense.
- Aviation safety is paramount.
- Assuring energy availability and efficiency is central to the growth of the aeronautics enterprise, and the environment must be protected while sustaining growth in air transportation.

Words like "vital" and "paramount" suggest that the Administration sees aeronautics R&D as important, but in NASA's budget for FY 2009, the request for aeronautics research is 13% less than Congress provided in FY 2008. In fact, this is the fifth year in a row that the Administration has requested a decrease for aeronautics research. Why?

Answer: "NASA has basically reorganized its aeronautics function, I think, in a very healthy way, restructured it to emphasize a smaller number of more focused objectives, back to basics as it were. There has been a lot of planning activity and policy-level activity on the aeronautics program. The President approved an aeronautics policy, and now we have an aeronautics strategic plan, and the expenditures that the President is requesting in the 2009 budget are consistent with the new look that NASA has given the aeronautics part and with the policy and strategic plans that have been developed." (February 26 Hearing Transcript page 61)

Follow-on Question:

- Is the requested budget for aeronautics research at NASA sufficient to accomplish the goals and objectives of the national aeronautics R&D plan?

Answer: Yes.

INVESTMENTS IN AERONAUTICS RESEARCH AND DEVELOPMENT

Dr. Marburger, what are your thoughts on the level of investment needed in aeronautics if our Nation is to become pre-eminent in the aerospace arena and not simply safeguard what we have?

Answer: The United States is pre-eminent in the aerospace arena and the President's FY 2009 Budget maintains our standing.

Background

NASA's FY 2000 budget includes $446.5 million for aeronautics, a decrease of $65.2 million from FY 2008 or nearly 13 percent. Advances in fundamental aeronautics research have driven the first two waves of aeronautics growth over the last century (first in propeller aircraft, then in jets). These revolutions have led to today's National Airspace System, the hub-and-spoke commercial air carrier industry, as well as innumerable military, public service and business aviation capabilities. Technological advances in aviation have directly benefited the American public by improving the quality of life and creating economic prosperity for the Nation.

Follow-on Questions:

- Do you believe that the United States can maintain its preeminence in aeronautics at the levels requested in the budget and the projected budget trend for such activities at NASA? How is that possible given an aeronautics program that continues on a downward flight path in the budget request?

Answer: Yes. However, it must be noted that the nation's pre-eminence in aeronautics will not be achieved by NASA's activities alone, but by the coordinated activities of a broad range of other departments and agencies, as well as the private sector. These roles and responsibilities were laid out in the National Aeronautics R&D Policy released in 2006. Furthermore, national priorities for aeronautics R&D were laid out in the recent National Plan for Aeronautics R&D and Related Infrastructure. The goals and objectives expressed in this Plan lay out a clear roadmap through 2020 for the R&D to meet key challenges in aeronautics.

- Is industry and academia to fill the gap? Given the state of today's economy is that likely or realistic?

Answer: Industry, academia and the Federal Government all help to advance aeronautics research and development (R&D). The federal role in aeronautics R&D has been clarified and prioritized within the National Aeronautics Research and Development Policy and the National Plan for Aeronautics R&D and Related Infrastructure.

- The waves of growth in aeronautics research occurred first in propeller aircraft and then in jets. Would you comment on the third wave of aeronautics research – must it not merely be an extrapolation of existing aviation capabilities but a radical technology shift that enables revolutionary enhancements of both the airspace system and the aircraft that fly within it if the U.S. is to remain the leader in this field?

Answer: We agree that a transformation in both aircraft capabilities and the system in which they fly is necessary to support future growth. The aeronautics research and development (R&D) priorities necessary to begin to achieve such a transformation are detailed within the National Aeronautics Research and Development Policy and the National Plan for Aeronautics R&D and Related Infrastructure.

- What critical programs to improve aviation capacity, safety, security and environmental compatibility of the U.S. air transportation system recommended by the National Academies Decadal Survey of Civil Aeronautics will have to be put aside given the Administration's request for aeronautics research and development at NASA?

Answer: Critical aeronautics R&D necessary to advance aeronautics has been detailed within the National Aeronautics Research and Development Policy and the National Plan for Aeronautics R&D and Related Infrastructure. This Plan did take into account inputs from the Decadal Survey, but focused research not on individual research disciplines, but rather on broad national capabilities that were represented by the Principles of the National Aeronautics R&D Policy.

U.S. ASTRONAUTS AND RUSSIAN SPACECRAFT

The Administrator of NASA testified recently that he is seeking to have the Administration make a formal request to Congress to amend the Iran, North Korea, and Syria Non-Proliferation Act legislation. This legislation is needed to use Russian spacecraft to deliver U.S. astronauts to the space station, but that other involved agencies have not yet agreed. What is the Administration's position on this matter?

Answer: On April 14, 2008, the Administration submitted a proposed amendment to Congress to extend the exception to the Iran, North Korea, and Syria Nonproliferation Act so that NASA can make payments to Russia for Soyuz crew transportation and rescue services until the Orion Crew Exploration Vehicle reaches Full Operational Capability or a U.S. commercial provider of crew transportation and rescue services demonstrates the capability to meet Station mission requirements. The amendment would also extend the exception through the life of the Station for payments for Russian-unique equipment and capabilities, such as sustaining engineering and spares.

Background

After the end of the space shuttle program in 2010 and before the first availability of the Orion spacecraft in 2015, Russian spacecraft may be the only way for U.S. astronauts to gain access to the space station. NASA would need to pay for its use of these spacecraft. Such payments to Russia would require changes in legislation by the end of this calendar year to amend the Iran, North Korea, and Syria Non-Proliferation Act.

Follow-on Questions

- When can Congress expect to receive this legislative proposal?

Answer: As noted above, this amendment was submitted on April 14, 2008.

- I understand that NASA needs this legislation enacted by the end of the calendar year. What is driving the schedule?

Answer: It is our understanding that NASA's scheduling concerns are being driven by the long lead times involved in purchasing and producing the necessary Russian Soyuz crew transport, launch vehicles (even for post-2011 launches), coupled with the length of time that will be required for negotiating the necessary new arrangements regarding such vehicles with Russia. For these reasons, NASA is very anxious to receive legislative relief before the end of the calendar year, and ideally this summer.

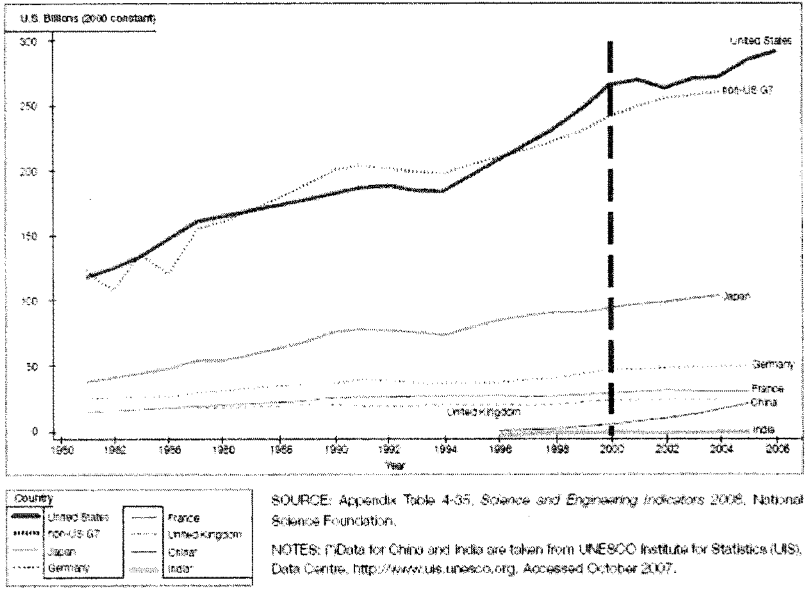
U.S. AND INTERNATIONAL R&D INVESTMENT TRENDS

Dr. Marburger, what are the trends both within our own economy and in other international economies that make investments in research and development at the levels assumed within American Competitiveness Initiative and the Innovation Agenda so important?

Answer: Please see below chart from the National Science Board, "Digest of Key Science and Engineering Indicators 2008" (page 4).

U.S. R&D investment totaled nearly $293 billion in 2000 constant dollars (or $340 billion in current dollars), more than any other nation and more than all other G7 countries combined.

Figure 1. R&D investment by selected country: 1981-2006



SOURCE: Appendix Table 4-35, *Science and Engineering Indicators 2008*, National Science Foundation.

NOTES: (*)Data for China and India are taken from UNESCO Institute for Statistics (UIS), Data Centre, http://www.uis.unesco.org. Accessed October 2007.

Why is this indicator important?

- One measure of a nation's level of commitment to innovation is the amount of money invested in R&D activities by all sectors.

Key Observations

- The United States has led all nations in R&D expenditures for the past two decades. There has been a steady increase of R&D expenditures for the United States over time, with a rate comparable to that of Japan and exceeding all others except for the recent acceleration of China.
- After a worldwide slowing in R&D expenditures in the early 1990s, R&D spending rebounded in the late 1990s in several G7 countries, with the United States experiencing the most robust growth.

Related Discussion

- The United States ranks second among G-7 countries in the share of gross domestic product (GDP) devoted to R&D. (See Figure 17 in this *Digest* for details.).
- When adjusting to factor in the lower costs of performing R&D in the developing world (using Purchasing Power Parity values, PPP), China is approximately the third largest R&D performer in the world after the US and Japan. (*SEI 2008* Appendix Table 4-2, Figure 4-15, UIS).

Background

While the European Union remains our closest competitor, the rapid rise of China's investment in research and development is unprecedented. China has surpassed Japan to become the world's third largest R&D performer. China increased the proportion of funds for scientific research from 0.83 percent of GDP in '99 to 1.44 percent of GDP in '04. China has announced a plan to increase that percentage to 2.5 percent of GDP by 2020.

Follow-on Questions:

- What is our position relative to the Europeans, China and Japan?

Answer: Please refer to the chart above.

- How would you characterize or assess the competitive threat posed by China, and what indicators should we be looking at to determine whether we are doing enough to maintain our competitiveness with China?

Answer: "Asia also is making focused investments in areas of science, particularly physical science, where they expect to be able to innovate in the future and compete with us in areas like information technology." (February 26 Hearing Transcript page 26) "It is not clear to what extent innovation and science-based programs are responsible for the great rate of growth of the Chinese economy, but certainly they expect it to be important in the future and they are investing heavily in it. They still have a long way to go, and it is not clear just how their approach to planning their economy will work out in the long run." (February 26 Hearing Transcript page 27)

- Is the data on China reliable? Are we comparing apples to apples when looking at U.S. vice China data on investments as a share of GDP?

Answer: Yes. Please refer to the chart above.

U.S. ECONOMY AND RESEARCH AND DEVELOPMENT INVESTMENTS

Dr. Marburger, has the economic downturn affected non-federal investments in research and development? Is it likely?

Answer: The processes through which non-federal R&D data is collected result in a reporting lag time of 1-2 years; therefore it would be premature to definitively conclude how the economic downturn has impacted private sector R&D investments.

Background

Today, the U.S. economy experiences a still-slumping housing market, an escalating credit crunch and spiraling inflationary pressures. Corporate profits are down. While the U.S. may narrowly dodge recession and experience economic growth of 1 or 2%, other global economies will be advancing as much as 10 percent. The emergence of a growing middle class in such key markets as China, India and Eastern Europe will make global dependence on the U.S. economy a thing of the past.

Follow-on Question:

- In light of these likely retrenchments, should the Federal government step forward to mitigate such reductions and, in doing so, provide an economic stimulus through programs such as the manufacturing extension partnership and the technology innovation programs, which leverage federal, state and private investments to implement and stimulate new manufacturing processes and technologies and focus on small- and medium-sized companies? (Note. The Administration proposes to eliminate funding for these programs in FY 2009.)

Answer: With respect to science and technology policy as it relates to economic stimulus, the President has very clearly stated, "the role of government is not to create wealth; the role of our government is to create an environment in which the entrepreneur can flourish." It is this principle that guides the policy priorities of the American Competitiveness Initiative.

- How long do expect this trend to continue? When do you anticipate these trends to start to pick back up?

Answer: This question should be directed to the economic experts.

- Given the growth of other international economies, particularly of China and India, how are we able to make any progress in maintaining our Nation's dominance in investments in research and development?

Answer: By fully implementing the American Competitiveness Initiative as the President called for, in particular by funding the President's Budget request, which is designed to do exactly that—ensure our global competitiveness through investments in high leverage basic research.

- Advances in science and technology in the United States have historically been fueled by combined public and private sector research and development investments of about $284 billion annually. In recent years, the mix of research funding has tilted toward the physical sciences and toward the development end of the research and development spectrum. In light of the current fiscal condition and the tilt toward development funding, how does OSTP determine whether the Nation's research investment is adequate to maintain our leadership in technological innovation?

Answer: Through the standard and ongoing collaborative processes including those undertaken by the National Science and Technology Council (NSTC), President's Council of Advisors on Science and Technology (PCAST), National Academy of Sciences (NAS), among others.

- Does OSTP have a process in place to review the efficiency and effectiveness of the current approach to federal funding for research?

Answer: One example of how OSTP reviews the efficiency and effectiveness of Federal research funding is the Program Assessment Rating Tool (PART). The Program Assessment Rating Tool (PART) was developed to assess and improve program performance so that the Federal government can achieve better results. A PART review helps identify a program's strengths and weaknesses to inform funding and management decisions aimed at making the program more effective. The PART therefore looks at all factors that affect and reflect program performance including program purpose and design; performance measurement, evaluations, and strategic planning; program management; and program results. Because the PART includes a consistent series of analytical questions, it allows programs to show improvements over time, and allows comparisons between similar programs.

- What efforts does OSTP have underway to encourage greater private sector collaboration and interdisciplinary research?

Answer: OSTP is reviewing how best to improve private sector collaboration through a high level advisory review led by PCAST. Additionally, the greatest amount of this activity occurs at the agency and program level.

- How does the current approach to funding research in the U.S. affect our ability to collaborate with the research efforts in other countries?

Answer: International collaboration is based on shared interests and shared needs. The international scientific community understands our budget process and relies on its US partner to fulfill its obligations. International interest in collaborating with the US science and technology community remains strong. However it is understood from the beginning of any joint program and stated in international agreements that US activities are dependent on appropriated funds.

U.S. SCIENTIFIC WORKFORCE

Dr. Marburger, what efforts does OSTP have underway to increase the science, math, and engineering skills of the domestic workforce?

Answer: Policy initiatives such as ACI and No Child Left Behind currently address the skills of our domestic workforce. The NSTC also has significant contributions in this area.

The ACI places front and center the idea that the bedrock of competitiveness is a well-educated and well-trained workforce, setting forth the vision for

- **a system of education that equips each new generation of Americans with the educational foundation for future study and inquiry in technical subjects that inspire their interest**
- **Institutions of higher education that provide students with access to world class education and research opportunities in STEM fields, and workforce training programs that provide more workers the opportunity to pursue the training and other services necessary to improve their skills and better compete in the 21st century.**

The ACI called for the establishment of several initiatives to improve skills including the creation of programs within the Department of Education (Math Now, AP/IB. and ATC), the establishment of the National Mathematics Advisory Panel (NMP, which recently completed its report containing science-based recommendations for the teaching and learning of mathematics, and the evaluation of STEM education programs. OSTP plays a major role in supporting the vision and implementation of the ACI. Specifically

- **OSTP has played a major role in the work of the NMP including the development of the executive order convening the panel, ex-officio membership on the panel, and supporting the dissemination of NMP recommendations.**

- **OSTP was involved in the work of the Academic Competitiveness Council. That effort resulted in the finding that many STEM education programs lack both a rigorous science base for their development and a plan for rigorous evaluation.**

- **Following on the recommendations of the ACC report, OSTP has reconstituted an Education Subcommittee under the National Science and Technology Council to advise and assist on**

  (1) Education policies, procedures and programs relating to Science, Technology, Engineering, and Mathematics (STEM) education and

workforce development;
(2) The scientific research base and methodological approaches for evaluating and improving STEM education programs; and
(3) Current, new and evolving strategies in public and private sectors for improving the teaching and learning of STEM education.

- **The first task of the newly reconstituted Education Subcommittee has been to address the recommendations of the ACC, specifically with respect to identifying high leverage education programs and developing and implementing rigorous evaluation designs. The group reported to Secretary Spellings and ACC agency heads on these efforts in March of this year and the group is completing its written report. The Subcommittee will now turn its attention to implementing evaluation designs and standardized metrics in other federal STEM programs.**

- **Other OSTP-led activities include**

    - **working with agencies to standardize the description of STEM education programs (so that programs can be compared against each other and similar programs can share quality improvement information),**
    - **an effort on the part of the NSTC Research Business Models Subcommittee to standardize information collected on grant personnel (to facilitate long term tracking of postdoctoral students so that information can be obtained about their career trajectories),**
    - **OSTP sponsorship of a graduate STEM education roundtable that convened members of academia, government, industry, and students to better understand STEM training as it is conducted today and its relationship to the nation's STEM workforce needs, and**
    - **OSTP sponsorship of a Competitiveness Summit, including sessions on STEM education and the STEM workforce.**

Background

Domestic demographic and educational changes have reduced the size and quality of the U.S. scientific workforce. For example, the performance of U.S. students lags behind the students of other countries in science, math, and engineering and large numbers of U.S. scientists are reaching retirement age.

Follow-on Questions:

- In light of the fact that today's worker may have several major career changes, does OSTP engage in any efforts to provide science, math, and engineering training to workers currently in the work force?

Answer: OSTP does not manage programs, but ACI includes a proposal to strengthen workforce training and re-training (please see ACI booklet on OSTP website- www.ostp.gov).

- Has OSTP helped develop a strategy to confront the loss of many skilled scientists and engineers to retirement and the need to issue increasing numbers of H1B visas?

Answer: ACI also addresses this issue by proposing to increase efforts to attract the best and brightest people from around the world to put their skills to work for America. With respect to the cap on H-1B visas, President Bush has stated "I think it's a mistake not to encourage more really bright folks who can fill the jobs that are having trouble being filled here in America -- to limit their number. And so I call upon Congress to be realistic and reasonable and raise that cap." There are also a variety of noteworthy public and private actions (by universities, corporations, the public school system, nonprofits, the public, government at all levels) that are working to sustain and improve America's position in the STEM fields.

- What efforts or initiatives does OSTP have underway to encourage greater participation by the private sector to help workers update their science, math, and engineering?

Answer: See workforce training answer above.

INVESTMENTS IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) EDUCATION

Dr. Marburger, in your opinion how best does this Nation enhance its science and technology enterprise, maintain our global economic leadership and ensure a continuous supply of highly-trained mathematicians, scientists, engineers, technicians and scientific support staff?

Answer: ACI, NCLB and the permanence of the R&D tax credit best meet the call for the U.S. to enhance its science and technology enterprise.

Background

In response to the 2005 National Academies' report *Rising Above the Gathering Storm*, the America COMPETES Act (COMPETES) seeks to ensure U.S. students, teachers, businesses and workers are prepared to continue leading the world in innovation, research and technology. With respect to education, the Act:

- authorizes $33.6 billion over fiscal years 2008 – 2010 for science, technology, engineering, and mathematics (STEM) research and education programs across the federal government;
- helps to prepare new teachers and provide current teachers with content and teaching skills in their area of education through NSF's Noyce Teacher Scholarship Program and Math and Science Partnership Program;
- expands programs at NSF to enhance the undergraduate education of the future science and engineering workforce, including at 2-year colleges;
- expands early career graduate-level grant programs and provides additional support for outstanding young investigators at NSF; and
- includes provisions to broaden participation of women and minorities in science and engineering fields at all levels.

Follow-on Questions:

- I am certain that you would agree, as the President has stated, that education is the gateway to opportunity and the foundation of a knowledge-based, innovation-driven economy. That being said, why does the Administration's budget ignore or neglect several areas of COMPETES, including math and science education activities at NSF, as well as cut education programs at NASA by nearly 20 percent?

Answer: The Administration is deeply committed to education as the gateway to opportunity. That commitment is embodied in the American Competitiveness Initiative which places front and center the idea that the bedrock of competitiveness is a well-educated and well trained workforce. The No Child Left Behind Act, a key bipartisan achievement, has demonstrated results for students across the country. Students are achieving record math and reading scores, and African American and Hispanic students are making significant progress, posting all-time high scores in a number of categories.

The Administration has also made significant achievements in ensuring that federal STEM education funds are wisely allocated in a way that supports those educational programs that are based on scientific evidence of effectiveness about teaching and learning. The Academic Competitiveness Council examined the nation's federal STEM investments and recommended that the development of such programs be based on science and that these programs include evidence of effectiveness- evidence gathered through rigorous evaluation designs that use standardized and outcome-based metrics. The table below describes the President's FY 2009 request for STEM education funding and is based, in part, on the findings of the ACC and efforts by the agencies to plan for and implement evaluation designs.

Federal STEM Education Program Funding and Count, by Agency: FY 2007-FY 2009
(Dollars in millions)

	FY 2007		FY 2008		FY 2009	
AgencyName	Enacted	Number of Programs	Enacted	Number of Programs	Request	Number of Programs
Department of Agriculture	$41	10	$44	12	$43	11
Department of Commerce	$42	8	$51	9	$31	5
Department of Defense*	$170	6	$208	7	$194	7
Department of Education	$759	11	$1,067	13	$1,114	14
Department of Energy	$28	6***	$31	6***	$37	6***
Department of Health and Human Services	$875	4	$874	4	$925	4
Department of Homeland Security	$13	1	$7	1	$7	1
Department of the Interior	$22	3	$24	3	$17	2
Department of Transportation	$154	6	$159	6	$154	6
Environmental Protection Agency	$12	4	$12	4	$11	4
National Aeronautics and Space Administration	$140	5	$128	4	$116	5
National Science Foundation	$947	34	$972	34	$1,024	33
Total	**$3,204**	**92**	**$3,575**	**96**	**$3,572**	**92**

*2008 and 2009 data for DoD are preliminary
** Includes 56 program activities

Federal agencies are moving to implement the recommendations of the ACC. NSF is a critical force in this effort. The Administration's FY 2009 request for Education and Human Resources (EHR) at NSF is $790.4 million, an increase of almost $65 million or almost 9 percent over FY 2008. NSF is working to make its education programs science based, having supported evaluations of programs such as the Robert Noyce Teaching Scholarship program. The ACC evaluation was recently completed and the information gleaned from it will form the basis of future programmatic directions. NSF is also incorporating evaluation into other programs such as Discovery Research K-12. Finally, NSF staff provide substantive and methodological expertise to other federal partners through the NSTC Education Subcommittee.

NASA, in particular, is working to evaluate its education portfolio having sponsored an external review and evaluation of its precollege education program to be carried out by the National Research Council. Among the findings in the December 2007 NRC report is that NRC was unable to draw conclusions about effectiveness of NASA programs because NASA does not have a coherent overall plan for evaluation and for how results of evaluation should inform program and project design and implementation. This finding echoes those of the May 2007 Academic

Competitiveness Council Report about federal STEM investments overall. The NRC report recommends that NASA's education programs be based on project-specific, focused goals; that measures of effectiveness be outcome based (rather than counts of participants); and that data systems be developed to support evaluation. Further, it recommended that the agency systematically coordinate with other federal agencies to draw on the expertise in the design of STEM education programs. NASA is now working toward these recommendations and working with federal partners through the National Science and Technology Council's Education Subcommittee.

NASA is committed, in the meanwhile, to ensuring that the projects that will be funded with the $116 million requested for the Office of Education and the tens of millions of dollars for education and public outreach embedded in mission directorate and Center budgets are aligned with and support NASA's education strategic framework.

- The Administration's FY 2009 request for Education and Human Resources (EHR) at NSF is $790.4 million, an increase of almost $65 million or almost 9 percent over FY 2008, yet the budget proposes to flat-fund two undergraduate programs, STEM Talent Expansion Program and the Advanced Technological Education Program, despite being authorized for 10 percent increases in COMPETES and within an NSF budget that grows in excess of 13 percent. What is the Administration's rationale for flat-funding these and reducing other education programs?

Answer: The budget requested for the Directorate for Education and Human Resources (EHR) in fiscal year 2009 totals $790.41 million, an increase of 8.9 percent over the estimated expenditure in fiscal year 2008 of $725.60 million. The budget would strengthen the leadership role on science, technology, engineering, and mathematics (STEM) education and workforce development that NSF has among federal agencies.

The increases address particular priorities: enabling more students to pursue graduate degrees; deepening research and the knowledge base for STEM education; improving designs, tools, and metrics for program evaluation; promoting teacher development; and fostering diversity in the STEM enterprise.

The priorities appear in the increases for these programs:

- **Graduate Research Fellowship (GRF) increases by $28.60 million (32.5%) to $116.70 million in EHR funding.**

- **Discovery Research K-12 (DR-K12) increases by $8.50 million (8.5%) to $108.50 million.**

- **Centers of Research Excellence in Science and Technology (CREST) increases by $5.53 million (22.1%) to $30.53 million.**

- **Project and Program Evaluation increases by $3.0 million (42.9%) to $10.0 million.**

- **Math and Science Partnership program (MSP) increases by $2.50 million (5.2%) to $51.0 million.**

- **Research on Gender in Science and Engineering (GSE) increases by $1.25 million (12.2%) to $11.50 million.**

The priorities correspond with ones highlighted in several reports and in America COMPETES, the authorizing legislation for NSF. That legislation authorizes significant increases between 2008 and 2010 for GRF (funding from both EHR and R&RA) and MSP (funding from EHR only). The authorization for GRF is $105.6 million in 2008 ($96.6 million in EHR), $117.2 million in 2009 (107.2 million in EHR), and $130.0 million in 2010 ($119.0 million in EHR). The authorization for MSP is $100.0 million in 2008, $111.0 million in 2009, and $123.2 million in 2010. It endorses as well initiatives for the broadening of participation. The report from the Academic Competitiveness Council (ACC) called for improvements in program evaluation; the addition to the evaluation area responds to that call.

- Why does this Administration have a bias against these critical investments in education?

Answer: As the above answers illustrate, this Administration does not have any kind of bias against these investments.

- In your opinion, what is the long-term effect of short-changing these education programs?

Answer: In my opinion, we are not short-changing these programs.

- What role in securing our Nation's preeminence in science and technology does K-12 teacher professional development serve?

Answer: Evidence shows that a substantial part of the variability in student achievement gains is due to who the teacher is and that there is a relationship between the teachers' mathematical knowledge and students' achievement. K-12 teacher professional development is essential to supporting our nation's teachers by helping them keep up to date on subject area content and the most effective strategies for teaching and learning. These strategies should be based on scientific evidence from rigorously designed evaluation studies. It is also important to note the National Math Panel found a paucity of evidence on the efficacy of K-12 teacher professional development.

RESEARCH AND DEVELOPMENT FUNDING BALANCE BETWEEN NASA AND NSF

Dr. Marburger, we discussed earlier the overall Federal research and development budget proposed in fiscal year 2009, and you indicated that the request represents a sound and balanced R&D program. I would like to examine, in particular, the R&D funding proposed for NASA and NSF and the balance between these agencies. Why in your judgment is it appropriate that funding for research and development at NSF be increased by 16 percent in fiscal year 2009 when it represents only 3.5 percent of all federal R&D activities in fiscal year 2008 and NASA's R&D budget grow by 3 percent though NASA represents 7 percent of the federal R&D budget in fiscal year 2008?

Answer: "The reason that NASA and NOAA aren't part of the doubling track, as it were, for the American Competitiveness Initiative is that – there are two reasons. The first one is that that they are more nearly adequately funded for the missions that they perform than these other parts of the science agency community; and secondly, that the direct product of their research is less relevant to long-term economic competitiveness and to the line of products that sustain the American economy and the likely future economy." (February 26 Hearing Transcript page 63)

Background

Of the $147 billion requested in the FY 2009 budget request for research and development funding, $10.7 billion is requested for NASA (7 percent) and $5.2 billion is requested for NSF (3.5 percent). The budget proposes, however, that NSF's research and development budget grow 16 percent compared to NASA's R&D growth of 3 percent.

Follow-on Questions:

- What benefits do the science, aeronautics and education programs at NASA contribute to the United States' leadership and competitiveness in science and technology sectors?

Answer: NASA's activities in science, aeronautics, and education contribute significantly to the United States' leadership and competiveness in science and technology. Indeed, in a recent Futron Corporation study ranking the "competiveness" of global space-faring nations, the US ranked 90% compared to the nearest competitor, Europe, who received a score of 50%. NASA's science programs are pushing the scientific and technical limits in astronomy, earth science, heliophysics, and the planetary sciences. In particular, the US is a world leader in space-based sensor technology which is driven in large part by the highly accurate requirements that NASA's science programs demand. In the field of aeronautics, the NASA is working closely with other US government agencies such as the DOD

and FAA to ensure that the nation's Next Generation Air Transportation System will be available in the 2025 timeframe. Lastly, NASA's education programs are leveraging the exciting work NASA does on the earth, in its atmosphere, and in the solar system to attract the nation's youth to pursue careers in science, technology, engineering and mathematics – the foundation for any nation's future in science and technology.

- Why were the scientific efforts of NASA not included in the President's American Competitive Initiative? In its exclusion, has this Administration and others minimized NASA's efforts and continuing contributions in the Nation's research and development efforts and competitiveness?

Answer: OSTP and other parts of this Administration are very much aware of the importance of NASA's past and current contributions to U.S. technology research and development efforts. The importance and long term benefit of such efforts by NASA were a key motivating factor behind the Vision for Space Exploration, which explicitly identifies the advancement of U.S. scientific, security and economic interests as a fundamental goal of the program. Moreover, the fact that NASA's space exploration efforts are the subject of a stand-alone Presidential policy document highlights the emphasis that this Administration places on NASA's activities and of the need for continued funding support in this area. By comparison, the American Competitiveness Initiative (ACI) was designed to focus on those high-leverage areas of foundational research in the physical sciences arena that are 1) expected to have the broadest impact in terms of benefits to innovation in other fields and applications, and 2) for which funding support has lagged for some time. The essential point is that NASA's research, development and scientific activities are more appropriately funded for the missions that they perform, while other very important areas of physical sciences research have been significantly underfunded for decades. The ACI is intended to help address this funding problem for these other important areas of research.

- In a hearing of the House Science Committee, Chairman Gordon noted, "NASA's technology program – something that should be the bedrock of an R&D agency – has been progressively whittled away to the point it is largely an afterthought in the fiscal year 2009 budget request." Do you agree with his assessment, and if not, why not?

Answer: OSTP certainly agrees that continued technology development across the range of NASA disciplines and activities is a very important element of NASA's overall mission. Different levels (and types) of technology development support are needed at different phases of a broad effort such as the Vision for Space Exploration, as well as for individual NASA spacecraft missions and programs involving cutting edge research and development (e.g., missions in the Science Mission Directorate). NASA is working hard to identify and support the appropriate level of technology investment for each of these categories of activity as the programs in question evolve (taking into account the relative phase and needs of

each effort). This is an ongoing challenge that will require continued assessment and monitoring in the months and years ahead, and OSTP intends to remain in close coordination with NASA and other White House offices on this important issue.

- Should the allocation of R&D development funding between NASA and NSF be adjusted given the needed investments in aeronautics and the critical state of our current air traffic control system?

Answer: The roles and responsibilities of departments and agencies are laid out in the National Aeronautics R&D Policy. The current allocation is appropriate and suits the primary missions of NASA and NSF with NSF focusing on basic research, and NASA aligning its aeronautics R&D efforts with the Next Generation Air Transportation System objectives to the maximum extent practicable.

ICEBREAKERS

Dr. Marburger, last year in the Committee's oversight hearings, the National Science Foundation indicated that the changing conditions in the Arctic may necessitate additional icebreaker capabilities for a variety of purposes, including transportation safety, homeland and national security, ocean and coastal exploration, and scientific research and monitoring. It was also indicated that interagency discussions were underway to assess the current and prospective requirements. Please describe for the Committee the status of the interagency discussion and the interagency group's findings and recommendations.

Answer: The interagency discussions include the Department of State, Department of Defense, Department of Homeland Security, Department of Commerce, Department of Transportation, Department of the Interior, and the National Science Foundation. The interagency group is reviewing previous executive branch policy documents, and evaluating possible policy changes that recognize future increases in human activity in the Arctic region. Additionally, the interagency group is reviewing the possible associated changes in agency's missions and responsibilities in the Arctic.

Background

The Coast Guard's three polar icebreakers – the *Polar Star*, the *Polar Sea* and the *Healy* – are severely aged and require significant maintenance. Only two were built to handle heavy ice. All are over 30 years old. Over the years, NSF's polar research has become the primary use of these ships. This year, NSF's budget eliminates funding to continue in caretaker status the *Polar Sea* since the NSF does not envision current or future use of this vessel in support of its mission.

Follow-on Question:

- Is a final report planned? Is it to include a financial plan and timetable for meeting the defined requirement?

Answer: A final report is not planned. The current interagency discussions focus primarily on national Arctic policy (though implications for Antarctic policy are being considered where appropriate). These discussions include reviewing the possibility that existing polar-capable assets may not meet agency's future polar mission requirements, and that future agency asset requirements to meet an increase in the operational tempo or expansion of Arctic missions should be evaluated. Once the interagency policy discussions are completed, agencies may use the results to identify and develop capability and resource requirements.

- When will the final plan be complete?

Answer: A deadline for the interagency discussions on Arctic policy has not been set.

- Do we have a national need for ice-breaking capabilities independent of the need to support scientific research in the Polar Regions, in your opinion?

Answer: The interagency process is intended, at least in part, to explore this very question. The Office of Science and Technology Policy recognizes there are national needs for ice-breaking capability not directly related to science. For example, there are obligations under international agreements that must fulfilled, such as the US – Denmark bilateral agreement regarding airbases in Greenland, and the multilateral agreement concerning the North Atlantic Ice Patrol.

- How do the findings compare to those of the National Academy of Sciences?

Answer: Consistent with the 2006 NAS study, the Administration recognizes that there may be significant national security and scientific requirements for polar icebreaking in both the Arctic and Antarctic regions.

OSTP DIRECTOR'S ADVICE TO THE PRESIDENT ON CLIMATE CHANGE

A number of charges have been made that the conduct of climate change science and expression of findings has suffered from political interference. What has been OSTP's role in ensuring the integrity of federally-funded climate change science? How would you respond to the charges that have been made?

Answer: The Administration does not interfere with science for political purposes or otherwise. To the contrary, this President has devoted unprecedented budgetary resources toward science, including research to better understand climate change. Spending on scientific research to assess the cumulative effects of anthropogenic greenhouse gas emissions on the earth's climate system approaches $2 billion annually. And the results of this spending have not been censored, but have contributed greatly to the world's understanding of the issue. The recent IPCC reports were largely supported by U.S. funded science.

Despite limited substance to the allegations that have been cited, OSTP believes that even the perception that a more serious problem exists merits action aimed at clarifying the Administration's position that scientific findings should be communicated clearly, accurately, and completely. Federal scientist complaints seem to result from a lack of clear and complete communication throughout an entire agency on the principles of scientific openness. Therefore, soon after the initial stories on this topic appeared (which focused on NOAA and NASA) OSTP urged Administrators Lautenbacher and Griffin to issue clear policy guidance throughout NOAA and NASA. Both agencies responded favorably.

Subsequently, in March 2006, OSTP hosted a meeting of all the principal science officials of the Federal government's departments and agencies. OSTP referred to the NASA policy, which was in development at the time, and led a discussion of the issues involved. OSTP urged all in attendance to ensure that similar policies are issued within their respective agencies. After the release of the NASA policy, OSTP re-stated its call to develop these policies via a subsequent letter with the NASA policy was attached, as well as at a June 2006, meeting of the NSTC's Committee on Science.

In addition, each year the Directors of OSTP and the Office of Management and Budget submit to the heads of all Federal departments and agencies a memorandum on the Administration's R&D priorities for the coming fiscal year. This memo is widely circulated and posted on OSTP's web site. This memo now includes a statement on scientific openness:

> "This Administration values science as a basis for effective action in its service to the public, and regards the timely, complete and accurate communication of scientific information an important part of that service. It is also essential for agencies to be

> aware of and coordinate within their organizations, and with other appropriate offices, the disclosure of information likely to have high public interest or impact on markets, regulatory affairs, or public health and safety. Accordingly, agencies have already been asked to develop, revise or re-emphasize policies related to scientific openness and to ensure that employees and management understand their rights and obligations under these policies. All federal employees, including scientists, are obliged to distinguish their personal views from the official positions of their agencies, and procedures should be in place to ensure that such distinctions are clearly drawn."

Finally, OSTP is finalizing the memo to departments and agencies, called for by the America COMPETES Act, dealing with the dissemination of scientific results.

In all these efforts, OSTP has received nothing but whole-hearted and enthusiastic support and encouragement from all offices within the Executive Office of the President and throughout the entire U.S. Government.

Background

Some observers question whether OSTP has represented the views of the scientific community or the Administration on climate change issues. While some believe the role of the OSTP director is to be independent of political positions, others believe that the OSTP director's role is to represent the White House view. Only recently has the White House openly acknowledged the likely major influence of human-related greenhouse gases on global climate change. Some individual government scientists and external groups have accused the Administration (but not necessarily OSTP) on several occasions of intervening in, and suppressing, federal science and communication of scientific findings. Recently, OSTP Director Marburger has spoken about the risks of climate change and policy implications.

Follow-on Questions:

- Given OSTP's role in reviewing and assessing climate change science, what advice would you give the President or the Congress about whether:

  (a) human-related greenhouse gases are the major influence on observed climate changes?

Answer: The President spoke to this point in June 2001. That statement is provided below:

Remarks by President Bush on Global Climate Change

President Bush
The White House Rose Garden
Washington, DC
June 11, 2001

THE PRESIDENT: Good morning. I've just met with senior members of my administration who are working to develop an effective and science-based approach to addressing the important issues of global climate change.

This is an issue that I know is very important to the nations of Europe, which I will be visiting for the first time as President. The earth's well-being is also an issue important to America. And it's an issue that should be important to every nation in every part of our world.

The issue of climate change respects no border. Its effects cannot be reined in by an army nor advanced by any ideology. Climate change, with its potential to impact every corner of the world, is an issue that must be addressed by the world.

The Kyoto Protocol was fatally flawed in fundamental ways. But the process used to bring nations together to discuss our joint response to climate change is an important one. That is why I am today committing the United States of America to work within the United Nations framework and elsewhere to develop with our friends and allies and nations throughout the world an effective and science-based response to the issue of global warming.

My Cabinet-level working group has met regularly for the last 10 weeks to review the most recent, most accurate, and most comprehensive science. They have heard from scientists offering a wide spectrum of views. They have reviewed the facts, and they have listened to many theories and suppositions. The working group asked the highly-respected National Academy of Sciences to provide us the most up-to-date information about what is known and about what is not known on the science of climate change.

First, we know the surface temperature of the earth is warming. It has risen by .6 degrees Celsius over the past 100 years. There was a warming trend from the 1890s to the 1940s. Cooling from the 1940s to the 1970s. And then sharply rising temperatures from the 1970s to today.

There is a natural greenhouse effect that contributes to warming. Greenhouse gases trap heat, and thus warm the earth because they prevent a significant proportion of infrared radiation from escaping into space. Concentration of greenhouse gases, especially CO2, have increased substantially since the beginning of the industrial revolution. And the

National Academy of Sciences indicate that the increase is due in large part to human activity.

Yet, the Academy's report tells us that we do not know how much effect natural fluctuations in climate may have had on warming. We do not know how much our climate could, or will change in the future. We do not know how fast change will occur, or even how some of our actions could impact it.

For example, our useful efforts to reduce sulfur emissions may have actually increased warming, because sulfate particles reflect sunlight, bouncing it back into space. And, finally, no one can say with any certainty what constitutes a dangerous level of warming, and therefore what level must be avoided.

The policy challenge is to act in a serious and sensible way, given the limits of our knowledge. While scientific uncertainties remain, we can begin now to address the factors that contribute to climate change.

There are only two ways to stabilize concentration of greenhouse gases. One is to avoid emitting them in the first place; the other is to try to capture them after they're created. And there are problems with both approaches. We're making great progress through technology, but have not yet developed cost-effective ways to capture carbon emissions at their source; although there is some promising work that is being done.

And a growing population requires more energy to heat and cool our homes, more gas to drive our cars. Even though we're making progress on conservation and energy efficiency and have significantly reduced the amount of carbon emissions per unit of GDP.

Our country, the United States is the world's largest emitter of manmade greenhouse gases. We account for almost 20 percent of the world's man-made greenhouse emissions. We also account for about one-quarter of the world's economic output. We recognize the responsibility to reduce our emissions. We also recognize the other part of the story -- that the rest of the world emits 80 percent of all greenhouse gases. And many of those emissions come from developing countries.

This is a challenge that requires a 100 percent effort; ours, and the rest of the worlds. The world's second-largest emitter of greenhouse gases is China. Yet, China was entirely exempted from the requirements of the Kyoto Protocol.

India and Germany are among the top emitters. Yet, India was also exempt from Kyoto. These and other developing countries that are experiencing rapid growth face challenges in reducing their emissions without harming their economies. We want to work cooperatively with these countries in their efforts to reduce greenhouse emissions and maintain economic growth.

Kyoto also failed to address two major pollutants that have an impact on warming: black soot and tropospheric ozone. Both are proven health hazards. Reducing both would not only address climate change, but also dramatically improve people's health.

Kyoto is, in many ways, unrealistic. Many countries cannot meet their Kyoto targets. The targets themselves were arbitrary and not based upon science. For America, complying with those mandates would have a negative economic impact, with layoffs of workers and price increases for consumers. And when you evaluate all these flaws, most reasonable people will understand that it's not sound public policy.

That's why 95 members of the United States Senate expressed a reluctance to endorse such an approach. Yet, America's unwillingness to embrace a flawed treaty should not be read by our friends and allies as any abdication of responsibility. To the contrary, my administration is committed to a leadership role on the issue of climate change.

We recognize our responsibility and will meet it -- at home, in our hemisphere, and in the world. My Cabinet-level working group on climate change is recommending a number of initial steps, and will continue to work on additional ideas. The working group proposes the United States help lead the way by advancing the science on climate change, advancing the technology to monitor and reduce greenhouse gases, and creating partnerships within our hemisphere and beyond to monitor and measure and mitigate emissions.

I also call on Congress to work with my administration to achieve the significant emission reductions made possible by implementing the clean energy technologies proposed in our energy plan. Our working group study has made it clear that we need to know a lot more.

The U.N. Framework Convention on Climate Change commences to stabilizing concentrations at a level that will prevent dangerous human interference with the climate; but no one knows what that level is. The United States has spent $18 billion on climate research since 1990 -- three times as much as any other country, and more than Japan and all 15 nations of the EU combined.

Today, I make our investment in science even greater. My administration will establish the U.S. Climate Change Research Initiative to study areas of uncertainty and identify priority areas where investments can make a difference.

I'm directing my Secretary of Commerce, working with other agencies, to set priorities for additional investments in climate change research, review such investments, and to improve coordination amongst federal agencies. We will fully fund high-priority areas for climate change science over the next five years. We'll also provide resources to build climate observation systems in developing countries and encourage other developed nations to match our American commitment.

And we propose a joint venture with the EU, Japan and others to develop state-of-the-art climate modeling that will help us better understand the causes and impacts of climate change. America's the leader in technology and innovation. We all believe technology offers great promise to significantly reduce emissions -- especially carbon capture, storage and sequestration technologies.

So we're creating the National Climate Change Technology Initiative to strengthen research at universities and national labs, to enhance partnerships in applied research, to develop improved technology for measuring and monitoring gross and net greenhouse gas emissions, and to fund demonstration projects for cutting-edge technologies, such as bioreactors and fuel cells.

Even with the best science, even with the best technology, we all know the United States cannot solve this global problem alone. We're building partnerships within the Western Hemisphere and with other like-minded countries. Last week, Secretary Powell signed a new CONCAUSA Declaration with the countries of Central America, calling for cooperative efforts on science research, monitoring and measuring of emissions, technology development, and investment in forest conservation.

We will work with the Inter-American Institute for Global Change Research and other institutions to better understand regional impacts of climate change. We will establish a partnership to monitor and mitigate emissions. And at home, I call on Congress to work with my administration on the initiatives to enhance conservation and energy efficiency outlined in my energy plan, to implement the increased use of renewables, natural gas and hydropower that are outlined in the plan, and to increase the generation of safe and clean nuclear power.

By increasing conservation and energy efficiency and aggressively using these clean energy technologies, we can reduce our greenhouse gas emissions by significant amounts in the coming years. We can make great progress in reducing emissions, and we will. Yet, even that isn't enough.

I've asked my advisors to consider approaches to reduce greenhouse gas emissions, including those that tap the power of markets, help realize the promise of technology and ensure the widest-possible global participation. As we analyze the possibilities, we will be guided by several basic principles. Our approach must be consistent with the long-term goal of stabilizing greenhouse gas concentrations in the atmosphere. Our actions should be measured as we learn more from science and build on it.

Our approach must be flexible to adjust to new information and take advantage of new technology. We must always act to ensure continued economic growth and prosperity for our citizens and for citizens throughout the world. We should pursue market-based incentives and spur technological innovation.

And, finally, our approach must be based on global participation, including that of developing countries whose net greenhouse gas emissions now exceed those in the developed countries.

I've asked Secretary Powell and Administrator Whitman to ensure they actively work with friends and allies to explore common approaches to climate change consistent with these principles. Each step we take will increase our knowledge. We will act, learn, and act again, adjusting our approaches as science advances and technology evolves.

Our administration will be creative. We're committed to protecting our environment and improving our economy, to acting at home and working in concert with the world. This is an administration that will make commitments we can keep, and keep the commitments that we make.

I look forward to continued discussions with our friends and allies about this important issue.

(b) human-induced climate change poses substantial negative risks to the quality of life for people?

Answer: We subscribe to the findings of the IPCC, which makes no such sweeping statements, though certain risks are enumerated in the following table from the IPCC Fourth Assessment Report, Working Group II, Summary for Policy Makers.

Phenomena and direction of trend [WGI SPM]	**Likelihood of future trend based on projections for 21st century using SRES scenarios [WGI SPM]**	**Examples of major projected impacts by sector**			
		Agriculture, forestry and ecosystems [4.4, 5.4]	**Water resources [3.4]**	**Human health [8.2]**	**Industry/settlement/ Society [7.4]**

Warmer and fewer cold days and nights; warmer/more frequent hot days and nights over most land areas	Virtually certain	Increased yields in colder environments; decreased yields in warmer environments; increased insect outbreaks	Effects on water resources relying on snow melt; increased evapo-transpiration rates	Reduced human mortality from decreased cold exposure	Reduced energy demand for heating; increased demand for cooling; declining air quality in cities; reduced disruption to transport due to snow, ice; effects on winter tourism
Warm spells/heat waves: frequency increases over most land areas	Very likely	Reduced yields in warmer regions due to heat stress; wild fire danger increase	Increased water demand; water quality problems, e.g., algal blooms	Increased risk of heat-related mortality, especially for the elderly, chronically sick, very young and socially-isolated	Reduction in quality of life for people in warm areas without appropriate housing; impacts on elderly, very young and poor.
Heavy precipitation events: frequency increases over most areas	Very likely	Damage to crops; soil erosion, inability to cultivate land due to water logging of soils	Adverse effects on quality of surface and groundwater; contamination of water supply; water scarcity may be relieved	Increased risk of deaths, injuries, infectious, respiratory and skin diseases, post-traumatic stress disorders	Disruption of settlements, commerce, transport and societies due to flooding; pressures on urban and rural infrastructures
Area affected by drought: increases	Likely	Land degradation, lower yields/crop damage and failure; increased livestock deaths; increased risk of wildfire	More widespread water stress	Increased risk of food and water shortage; increased risk of malnutrition; increased risk of water- and food-borne	Water shortages for settlements, industry and societies; reduced hydropower generation potentials; potential for population migration

				diseases	
Intense tropical cyclone activity increases	Likely	Damage to crops; windthrow (uprooting) of trees; damage to coral reefs	Power outages cause disruption of public water supply	Increased risk of deaths, injuries, water- and food-borne diseases; post-traumatic stress disorders	Disruption by flood and high winds; withdrawal of risk coverage in vulnerable areas by private insurers, potential for population migrations
Increased incidence of extreme high sea level (excludes tsunamis)c	Likely	Salinisation of irrigation water, estuaries and freshwater systems	Decreased freshwater availability due to saltwater intrusion	Increased risk of deaths and injuries by drowning in floods; migration-related health effects	Costs of coastal protection versus costs of land-use relocation; potential for movement of populations and infrastructure; also see tropical cyclones above

(c) the risks of abrupt, potentially catastrophic, changes in the climate system and the environment increase with each addition of greenhouse gases we emit?

Answer: Again, we would rely on the findings of the IPCC on this issue. The IPCC WGII SPM mentions abrupt impacts only once: "it is very unlikely that the Meridional Overturning Circulation (MOC) in the North Atlantic will undergo a large abrupt transition during the 21st century." Abrupt climate change is a topic of ongoing research currently underway.

(d) we know regions vulnerable to climate change, and the nature of the vulnerabilities? And

Answer: In addition to the impacts outlined in the table above, the IPCC WGII SPM includes the following passage to help describe the scope of vulnerabilities:

"Magnitudes of impact can now be estimated more systematically for a range of possible increases in global average temperature.

Since the IPCC Third Assessment, many additional studies, particularly in regions that previously had been little researched, have enabled a more systematic understanding of how the timing and magnitude of impacts may be affected by changes in climate and sea level associated with differing amounts and rates of change in global average temperature.

Examples of this new information are presented in Table SPM-1. Entries have been selected which are judged to be relevant for people and the environment and for which there is high confidence in the assessment[13]. All entries of impact are drawn from chapters of the Assessment, where more detailed information is available.

Depending on circumstances, some of these impacts could be associated with 'key vulnerabilities', based on a number of criteria in the literature (magnitude, timing, persistence/reversibility, the potential for adaptation, distributional aspects, likelihood and "importance" of the impacts). Assessment of potential key vulnerabilities is intended to provide information on rates and levels of climate change to help decisionmakers make appropriate responses to the risks of climate change. [19.ES]

The 'reasons for concern' identified in the Third Assessment remain a viable framework for considering key vulnerabilities. Recent research has updated some of the findings from the Third Assessment. [19.3.7]"

(e) scientific evidence indicates sufficient risk to begin taking express mitigative action now, beyond business-as-usual programs and initiatives for other policy reasons?

Answer: Quoting directly from the IPCC WGII SPM,

"Many impacts can be avoided, reduced or delayed by mitigation.
A small number of impact assessments have now been completed for scenarios in which future atmospheric concentrations of greenhouse gases are stabilized. Although these studies do not take full account of uncertainties in projected climate under stabilization, they nevertheless provide indications of damages avoided or vulnerabilities and risks reduced for different amounts of emissions reduction. [2.4, T20.6]"

- How would you rate OSTP's performance over the past few years in overseeing the Nation's climate change science and technology programs, and in providing useful advice to the President and other decision-makers?

Answer: OSTP, through the National Science and Technology Council, has provided oversight for the Climate Change Science Program and the Climate

Change Technology Program jointly with the Committee on Climate Change Science and Technology Integration. This deputy-Secretary level body provides oversight for both programs. The Department of Energy manages the Climate Change Technology Program on a daily basis, and the Department of Commerce manages the Climate Change Science Program on a daily basis. This mechanism provides for communications among agencies, and communication of key results and interpretations to the President and other key decision makers.

THE FY 2009 BUDGET PROPOSAL AND SCIENTIFIC NEEDS AND PRIORITIES FOR CLIMATE CHANGE SCIENCE

Dr. Marburger, you have stated that the three greatest challenges for science are to (a) assess impacts, (2) identify mitigation options, and (3) devise adaptations. Do you consider that the funding for climate change activities is well balanced across these three challenges in the proposed FY2009 budget? Is the balance about right as proposed among basic scientific research, development of mitigation options, assessment of climate change impacts on human and ecosystems, and development of adaptation measures?

Answer: The scientific basis for assessing climate change impacts and developing adaptation strategies is in the formative stage. The Climate Change Science Program budget is more than $2 billion for FY 2009, and two of the CCSP goals are:

- **Understand the sensitivity and adaptability of different natural and managed ecosystems and human systems to climate and related global changes; and**
- **Explore the uses and identify the limits of evolving knowledge to manage risks and opportunities related to climate variability and change.**

For FY06-08, the proportion of funding within the CCSP budget accounts for these two goals is about 18% of the total (Our Changing Planet, 2008, p.198). The remaining 82% of CCSP funding has been devoted to the following three goals:

- **Improve knowledge of the Earth's past and present climate and environment, including its natural variability, and improve understanding of the causes of observed variability and change**
- **Improve quantification of the forces bringing about changes in the Earth's climate and related systems**
- **Reduce uncertainty in projections of how the Earth's climate and related systems may change in the future**

The emphasis on impacts and adaptation will be increased for FY09, but no precise numbers can be attributed to those goals at this time. Increased emphasis on impacts and adaptation should not be accomplished at the expense of the other three goals, which are foundational to all aspects of climate change science.

Mitigation efforts focus primarily on technologies to reduce CO2 emissions. The total budget for the Climate Change Technology Program for FY2009 is about $4.4 billion.

This current balance of funding is appropriate considering the maturity of the science. The balance will certainly shift as progress in these emerging fields increases, and as other Federal agencies become involved in the effort.

Background:

Dr. Marburger, in addressing the American Geophysical Union in December 2007 stated that the three great challenges for addressing climate change are to: (1) estimate the impacts of climate change; (2) "identify mitigations"; and (3) devise adaptations. Dr. Marburger also stated that the first of these – estimating the impacts – is the greatest challenge for science. Regarding impacts and adaptation, he said:

> "Despite the difficulty of forecasting regional impacts, some strategies are obvious. Populations that are already stressed by flooding, drought, and desertification are clearly vulnerable. Investments in better water management, zoning regulations, and agricultural practices will have an immediate impact on the quality of life for these populations, and they are also an essential part of any climate response strategy. We already know the vulnerable regions and we already know the nature of their vulnerabilities."

Although he expressed this view, it is unclear whether work to improve understanding of impacts on human systems and ecology is remaining stable or increasing in priority (beyond increased investment in observation satellites and climate modeling). The budgets of several of the agencies with the main programs on impacts and adaptation are proposed for budget cuts (e.g. Environmental Protection Agency, Department of Agriculture, etc.).

Follow-on Questions:

- The 2007 report from the Climate Change Science Program on greenhouse gas scenarios and economic modeling indicates that energy efficiency and renewable energy would provide major, cost-effective reductions of future greenhouse gas emissions. Why, then, is the energy efficiency and renewable energy element proposed for large budget cuts?

Answer: Energy efficiency is integral to any realistic and economically sustainable climate change mitigation strategy. It also has important ancillary benefits, such as enhancing energy security. Modeling work done for the Climate Change Technology Program (detailed in its Strategic Plan), the Climate Change Science Program (detailed in its Scenarios of Greenhouse Gas Emissions and Atmospheric Concentrations report), and the International Energy Agency (detailed in its Energy Technology Perspectives 2008, Scenarios and Strategies to 2050), among others, all show that energy efficiency provides early opportunities to achieve significant and relatively low-cost emissions reductions across broad sectors of the economy. The Administration has a robust portfolio of technical activities for reducing GHG

emissions and energy efficiency is key among them. Indeed, the Department of Energy's Budget Highlights document identifies energy efficiency as one of the two key investment areas for the Department in combating climate change. The Budget Highlights note: "In support of the administration's climate change technology initiatives and to implement the U.S. Climate Change Technology Program's Strategic Plan, the FY 2009 budget emphasizes a two-pronged strategy for its climate change technology programs: invest in long-lead, high-risk, high carbon dioxide (CO_2) mitigation technologies in coal with carbon capture and storage (CCS) and in nuclear power, and invest in near-term, lower risk, high CO_2 mitigation technologies focused on improving energy efficiency." Energy efficiency, therefore, is one of the pillars of the Department's climate change mitigation strategy.

Moreover, the effective application of new or improved technologies for energy efficiency and renewable energy is not a simple function of funding for the Department of Energy. The Energy Independence & Security Act of 2007, signed by the President, will :

Help reduce America's dependence on oil by:

1. **Increasing the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022. Although the President proposed a more ambitious alternative fuels standard in his State of the Union Address, the RFS in the bill he signed today represents a nearly five-fold increase over current levels.**

2. **Reducing U.S. demand for oil by setting a national fuel economy standard of 35 miles per gallon by 2020 – which will increase fuel economy standards by 40 percent and save billions of gallons of fuel. Last January, the President called for the first statutory increase in fuel economy standards for automobiles since they were enacted in 1975, and the bill he signed today delivers on that request. The bill also includes an important reform the President has called for that allows the Transportation Department to issue "attribute-based standards," which will ensure that increased fuel efficiency does not come at the expense of automotive safety.**

The bill includes provisions to improve energy efficiency in lighting and appliances, as well as requirements for Federal agency efficiency and renewable energy use that will help reduce greenhouse gas emissions. For example:

- **The bill will require all general purpose lighting in Federal buildings to use Energy Star® products or products designated under the Energy Department's Federal Energy Management Program (FEMP) by the end of Fiscal Year 2013.**

- **The bill will update the Energy Policy and Conservation Act to set new appliance efficiency standards that will save Americans money and energy. The Act amends the Energy Policy and Conservation Act (EPCA) to prescribe or revise standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.**

- **The bill will establish an Office of High-Performance Green Buildings (OHPGB) in the U.S. General Services Administration. This office will promote green building technology implementation in Federal buildings.**

Taken together, all of these measures could reduce projected CO2 emissions by billions of metric tons.

- **These results help advance the U.S. commitment at the UN climate change meeting in Bali last week to pursue quantifiable actions to reduce carbon emissions.**

- Dr. Marburger, you have cited devising adaptations to climate change as one of the three great challenges for science. What portion of climate change science and technology investment is proposed for research on, and applications of, impacts and adaptation technologies? What are the priority sectors or needs? In which agencies are the budgets proposed for these activities? Is there a proposal to increase funding, to reflect the stronger scientific consensus on the processes and risks of climate change and greater convergence in the regional results of the climate models?

Answer: In the joint memo issued by OSTP and OMB providing guidance for agencies in their FY2009 budget requests, the Administration states:

"Climate science investments are critical to improving our understanding of global climate variability and change, providing the basis for sound decision-making, and enabling the development of new, cleaner technologies. So as to better inform policy, agencies should continue to make investments to improve our ability to observe, model, assess, and adapt to impacts of climate change, particularly on a regional scale, and to assure the availability of critical long-term climate data. Agencies should continue supporting the goals of the 2003 *Strategic Plan for the U.S. Climate Change Science Program*; and align climate science investments with the specific priorities articulated in the Climate Change Science Program FY 2009 Interagency Implementation Priorities memo."

The CCSP memo referenced says the following:

"All of CCSP's FY 2009 interagency implementation priorities will produce knowledge that can be used to help make better decisions pertaining to a wide variety of decisions affected by climate change. In the coming year, CCSP expects to add to this portfolio by developing a new priority effort for FY 2010 aimed at understanding ongoing and potential future impacts of climate change on human health, and informing decisions aimed at increasing public health resiliency to environmental change."

Additional Questions for the Record

The National Science Board's 2008 Science and Engineering Indicators shows continued decreases in the contribution of industrial-based basic research to the overall U.S. basic research efforts. How will the Administration encourage greater intellectual interchange between industry and academia at a time when these interactions appear to be diminishing?

Answer: The President's Council of Advisors on Science and Technology is in the process of reviewing these relationships and making recommendations on the appropriate role for the Federal government in facilitating interactions such as these. The Administration looks forward to receiving and responding to those recommendations.

Results from the Program for International Student Assessment (PISA) continue to show U.S. students lagging behind their foreign counterparts in areas such as mathematical literacy and problem-solving skills. What steps is the Administration taking to ensure that U.S. students are competitive in science, technology, engineering and mathematics (STEM) with their international peers?

Answer: International comparisons of students and educational systems are inherently difficult to make for many reasons including differences in the years in which tests are administered and differences in question format (which have implications for performance among specific subgroups). Having said that, the 2006 PISA results released late last year show no significant changes from 2003 and the US remains in the middle range of performance in science literacy and a below average performance in mathematics literacy.

To address these concerns the Administration is undertaking a variety of initiatives including:

- **The Academic Competitiveness Council identification of STEM education programs across government and developing outcomes-based metrics for evaluating their effectiveness**
- **Reconstituting the NSTC's Education Subcommittee to implement rigorous evaluation designs within STEM education programs so that effectiveness can be determined based on improved student performance.**
- **Establishing, under Executive Order, the National Mathematics Advisory Panel which has now released its recommendations pertaining to the learning and teaching of mathematics.**
- **Establishing ACI initiatives such as Math Now, Advanced Placement and the Adjunct Teacher Corps aimed at improving student performance using evidence-based and proven strategies for teaching.**

As basic research can be expected to be a major driver in the future for innovations that result in new industries and new jobs, how will the Administration ensure the health and vitality of the U.S. basic research enterprise moving forward?

Answer: The President's ACI directly addresses the need for increased funding for basic research.

What is the Administration (or National Science Board) doing to address the Nation's energy concerns? (e.g. the Board has a Task Force on Sustainable Energy)

Answer: The President's American Energy Initiative (AEI) was introduced to specifically address the Nation's energy concerns.

The America COMPETES Act expresses the sense of Congress that each executive agency that funds research should allocate an appropriate percentage of the annual basic research budget of such agency to funding high-risk, high-reward basic research projects. Have federal agencies allocated a percentage of their basic research budget for high-risk, high-reward projects as requested in the America COMPETES Act? If so, what percentage is it? How are the agencies planning to implement this funding so that high-risk, high-reward research is funded? If not, why not?

Answer: Federal support for high-risk, high-reward research is a key element of the Nation's R&D portfolio, and has historically led to many revolutionary advances that have transformed our way of life. Federal support for this type of research is driven "from the ground up," according to agency missions and needs. The level of resources an agency (and the Federal Government as a whole) devotes to high-risk, high-reward research should depend on the needs of the agency, including consideration of competing priorities, the quality of proposals to conduct such research, the likelihood that high-risk, high reward research in a specific area will be fruitful, and other factors. Given this funding structure, implementation of specific agency-wide set-asides for this activity may not be advisable, especially in the context of competing needs and priorities. In light of this realty, agencies are working to examine how best to ensure an appropriate amount of high-risk, high-reward funding is being supported. At the National Science Foundation, for example, a review is under way to determine options and policies to enhance facilitation of potentially transformative research

The America COMPETES Act indicates that OSTP should develop and issue an overarching set of principles to ensure communication and open exchange of data and results of research conducted by federal scientists. Has OSTP developed and issued principles regarding communication and open exchange of data, and research results for federal government researchers? If so, what are they? If not, has OSTP taken steps to do so?

Answer: OSTP has developed a draft set of principles to meet this statutory requirement. The law requires OSTP to develop these principles in consultation

with the Director of the Office of Management and Budget (OMB) and the heads of all Federal civilian agencies that conduct scientific research. Currently, OSTP is reviewing and incorporating the comments received from OMB and other relevant federal agencies. The final set of principles should be released in the very near future.

The America COMPETES Act states that OSTP should convene a National Science and Technology Summit of industry, academic, and government leaders to examine the health and direction of the U.S. science and engineering enterprise. In addition, OSTP is to establish a President's Council on Innovation and Competitiveness whose members would include the Secretary or head of federal agencies. The Council is to monitor implementation of public laws and initiatives for promoting innovation. The America COMPETES Act requests that OSTP convene a National Science and Technology Summit and establish a President's Council on Innovation and Competitiveness. What steps has OSTP taken to do so?

Answer: OSTP is in the process of organizing the National Science and Technology Summit, which should take place during the summer of 2008. OSTP has decided to hold the summit at the Oak Ridge National Laboratory and is currently identifying participants and setting an agenda. Pursuant to section 1006 of the America COMPETES Act, the President is charged with establishing the President's Council on Innovation and Competitiveness. Further, section 1006(e) authorizes the President to designate an existing council to carry out the requirements of the section. Accordingly, the President designated the NSTC Committee on Technology to carry out the requirements of the section.

The America COMPETES Act states that OSTP should encourage semiannual Science, Technology, Engineering, and Mathematics Days at all elementary and secondary schools to bring mentors and hands-on lessons to excite and inspire students. What steps has OSTP taken to encourage semi-annual science, technology, engineering, and mathematics days at the nation's elementary and secondary schools, as requested in the America COMPETES Act?

Answer: OSTP is currently working with the Domestic Policy Council and the White House proclamation office to identify appropriate activities in order to establish semiannual Science, Technology, Engineering, and Mathematics Days.

According to the America COMPETES Act, the National Science and Technology Council (NSTC), an interagency group managed by OSTP, is to identify and prioritize the deficiencies in the nation's research facilities and instrumentation to coordinate acquisition, refurbishment, and maintenance. What is the status of the nation's research facilities and instrumentation?

Answer: OSTP has engaged in preliminary discussions with relevant primary agencies and is currently working to establish a subcommittee working group and task this working group with an appropriate charter.

Does the NSTC plan to identify and prioritize deficiencies in the nation's research infrastructure as requested in the America COMPETES Act?

Answer: OSTP is working to execute this COMPETES Act requirement.

NASA

The America COMPETES Act states that federal agencies should allocate a percentage of their basic research budget for high-risk, high-reward projects. Has NASA allocated a percentage of its basic research budget for high-risk, high-reward projects? If so, what percentage is it? How is NASA planning to implement this funding so that high-risk, high-reward research is funded? If not, why not?

Answer: NASA has provided a report to Congress in response to the COMPETES Act's requirement that agencies report the percentages of their basic research budgets that are supporting high-risk, high-reward projects. Please refer to NASA's report to Congress for a detailed response to these questions.

The America COMPETES Act expresses the sense of Congress that the International Space Station offers unique educational opportunities and a unique resource for research and development that can enhance U.S. global competitiveness. The America COMPETES Act states that NASA should develop detailed plans to identify and support research and science, technology, and engineering educational projects that utilize the International Space Station National Laboratory facilities. Has NASA done so? If so, what are they? If not, why not?

Answer: As directed in the 2005 NASA Authorization Act, NASA has been actively engaging other agencies and organizations for some time to identify potential new research and development activities and approaches involving the International Space Station (ISS). A summary of these efforts was provided in NASA's May 2007 report to Congress on ISS issues (entitled "NASA Report to Congress Regarding a Plan for the International Space Station National Laboratory"). Please see that report for further detail on NASA's activities in this area to date. As these evaluations by NASA proceed, OSTP will continue to coordinate with NASA in order to understand the status of additional planning activities that may be underway in this area, and also to provide policy guidance as needed.

The America COMPETES Act states that federal agencies should allocate a percentage of their basic research budget for high-risk, high-reward projects. Has NASA allocated a percentage of its basic research budget for high-risk, high-reward projects? If so, what percentage is it? How is NASA planning to implement this funding so that high-risk, high-reward research is funded? If not, why not?

Answer: Same as identical question above.

NSF

The America COMPETES Act incorporated the reauthorization of the National Science Foundation (NSF). The America COMPETES Act authorizes $5,742.0 million for NSF's Research and Related Activities (R&RA) in FY2009. The President's budget requests funding of $5,594.0 million for NSF's research and related activities (R&RA) account in FY2009. Why is the Administration proposing funding of NSF's research activities at a level below that authorized in the America COMPETES Act?

Answer: In light of the $310 million cut to the President's FY 2008 request for NSF Research, funded at only $4,821 million (1.3 percent growth) in the Omnibus, the Administration would be thrilled with a $773 million increase in FY 2009, which represents 16 percent overall growth with priority increases approaching 20 percent for the physical science directorates. One-year growth in excess of this magnitude may present project management concerns. The level requested is fully consistent with year three of a ten-year doubling path the President called for and committed to in his 2006 State of the Union presentation of the American Competitiveness Initiative.

The mission of the Experimental Programs to Stimulate Competitive Research program (EPSCoR) is to strengthen research and education in science and engineering throughout the United States to avoid undue concentration in a few parts of the United States. The America COMPETES Act authorized level for EPSCoR is $133.2 million in FY2009. The President's budget requests funding of $113.5 million in FY2009. Why is the Administration proposing to fund the EPSCoR program at a funding level well below that authorized in the America COMPETES Act?

Answer: From FY 1997 to FY 2009, EPSCoR's budget has tripled (198 percent growth) while the overall NSF budget has approximately doubled (108 percent growth). Over the same period of time, the average annual growth rate of the EPSCoR Budget has been approximately 10 percent compared to approximately 6 percent for NSF overall. The funding level requested in FY 1009 builds on the strong growth provided in FY 2008.

The goal of the Integrative Graduate Education and Research Traineeship (IGERT) program is to catalyze a cultural change in graduate education by establishing innovative new models for graduate education and training. This mechanism of funding graduate students is called traineeships. The America COMPETES Act FY2009 authorized level is $52.5 million, while NSF's FY2009 budget request is for $38.8 million. NSF proposes increasing the funding for its Graduate Research Fellowship (GRF) program and also its research funding, which would provide support to graduate students as research assistants. Why is the Administration proposing to fund the IGERT program as a funding level well below that authorized in the America COMPETES Act? Is this an indication that the Administration prefers research assistantships and fellowships over traineeships as the best way to fund graduate students? If so, why?

Answer: The President's budget includes programs representing a range of models for graduate education and training with a primary emphasis on programs which are based on evidence of effectiveness from studies employing rigorous evaluation design.

IGERT is a cross-directorate NSF program noteworthy for its emphasis on interdisciplinary research and the communications skills of graduate students in science, technology, engineering and mathematics.

The America COMPETES Act authorizes two new activities – the Professional Science Master's Degree Program to establish educational programs that produce individuals to work in high-need fields, and the Laboratory Science Pilot Program to improve the laboratories in the nation's schools. What is the status of the new activities authorized by the America COMPETES Act at NSF — the Professional Science Master's Degree Program and the Laboratory Science Pilot Program? Does NSF plan to fund them in FY2009?

Answer:
Professional Science Masters Program
The PSM Program is already well-established after years of financial support from the Sloan Foundation, which narrows the scope of NSF's possible response and helps to define what the agency could contribute to enhance its future success. NSF believes that the program is a success and that future prospects of the PSM program are brighter following the recent formation of the National Professional Science Masters Degree Association (NPSMA). NPSMA has a full time executive director and a professionally designed web site that is beginning to operate a clearinghouse for best practices in PSM programs.

NSF is studying the PSM model in detail and considering how the agency might be maximally effective in supporting this program. This includes following quite closely activities underway related to the PSM degree -- and considering their relationship to some of NSF's extant programs. (PSM objectives are broadly compatible with several current NSF activities, for example, industry – university cooperative research programs.) NSF will continue to monitor closely developments in existing PSM programs and NPSMA and consider what the agency can usefully contribute to the program through a possible funding request in FY 2010. Approval of the FY2009 NSF budget request would provide sufficient resources for the monitoring and planning that NSF will undertake.

Laboratory Science Pilot Program
The pilot *Partnerships for Access to Laboratory Science Program* is very broadly defined: It should be a high school program, and the program should require complex partnerships comprised of (1) a college, (2) a high-need local educational agency and associated school, and (3) a business or non-profit organization. This partnership could also include a state educational agency, a National Lab, and a

community service organization. NSF awards must be substantially cost-shared, with no more than 40% of the budget coming from NSF.

The program parameters as defined by the America COMPETES Act provide considerable latitude in deciding how to approach the task of providing high school students with educational activities that are lab like. Cyber-enabled approaches have the promise of being very cost effective and NSF has already have gained considerable experience in this area.

Because there appears to be a high need for high school labs (and because there are so many public high schools in the US) NSF has determined that a sensible course of action is to examine what could be done to support high school science lab activities through the agency's initiatives on cyber -enabled learning, which include ITEST (Innovative Technology Experiences for Students and Teachers) and NSDL (the National Science Distributed Learning Program). NSF will also work collaboratively with the Department of Education in this arena, as we already are doing in the Math Science Partnership Program. Cyber-enabled learning is one of 5 themes that define EHR Programs at NSF. In addition, among other objectives these two current programs are seeking to meet the challenge of scaling-up to serve a large number of users.

As noted earlier, the America COMPETES Act indicates that each executive agency that funds research should allocate an appropriate percentage of its annual basic research budget to fund high-risk, high-reward basic research projects. The National Science Board (NSB) found that researchers are reluctant to submit radical or paradigm-challenging research ideas to NSF. The America COMPETES Act states that federal agencies should allocate a percentage of their basic research budget for high-risk, high-reward projects. The National Science Board indicates this is a particular challenge at NSF as researchers are reluctant to submit radical or paradigm-challenging research ideas. What actions, if any, is NSF taking to respond?

Answer: In response to report language (H. Rept. 110-497) associated with the Consolidated Appropriations Act, 2008 (P.L. 110-161), NSF is in the final stages of preparing a report for Congress to address this very issue.

In the Education and Human Resources (EHR) directorate, the President's FY2009 budget proposes $790.0 million compared to an authorization of $995.0 million in FY2009. Why is the Administration proposing funding of NSF's education activities at a level below that authorized in the America COMPETES Act?

Answer: The Administration has proposed the above amount as a result of prioritization within the NSF's budget.

The Robert Noyce Teacher Scholarship program encourages science, technology, engineering, and mathematics majors and professionals to become K-12 mathematics and science teachers by providing funds to institutions of higher education to support scholarships, stipends, and programs for students who commit to teaching in high-need K-12 school districts. The FY2008 budget estimate in the FY2009 request is at a level ($11.8 million) below that specified in the explanatory statement for the FY2008 appropriations bill by the appropriators ($15 million). The America COMPETES Act FY2009 authorization is $115.0 million. The FY2009 budget request is $11.6 million. The Administration indicates in its FY2009 budget request that the Robert Noyce Teacher Scholarship program FY2008 budget estimate is at a level ($11.8 million) below that specified in the explanatory statement for the FY2008 appropriations bill by the appropriators ($15 million). In addition, the Administration is proposing funding the program well below its authorization level in FY2009. Why?

Answer: The Robert Noyce Scholarship program is provided $15 in the current FY 2008 NSF plan. The Noyce program is relatively new and is currently undergoing an evaluation that is expected to be completed in December 2008 to serve as the foundation for longitudinal and comparative studies of the impacts of the Noyce program investment. Until the foundational evaluation work is complete and NSF is able to review the results and their implications, if any for program modifications, a substantial increase in funding for Noyce is not requested.

The Noyce Teacher Scholarship program is one of a broad portfolio of programs within NSF's EHR directorate that supports teachers, resources for teachers, and teacher development. In addition to Noyce, that portfolio includes the Math and Science Partnership Program (see next question) and Discovery Research K-12 that does so through the research it supports on teaching and learning. The Louis Stokes Alliances for Minority Participation (LSAMP) program and Tribal Colleges and Universities Program (TCUP) include activities for attracting diverse talent to STEM teaching. The Graduate Teaching Fellowships in K-12 Education program (GK-12) gives graduate students in STEM contact with the pre-college sector and enlarges the resources available to K-12 teachers.

The Math and Science Partnership (MSP) program provides grants to teams composed of institutions of higher education, local K-12 school systems, and their supporting partners to develop and implement pioneering ways of advancing mathematics and science education for students. The MSP FY2009 authorization is $111.0 million. The FY2009 request is for $51.0 million. The America COMPETES Act expresses the sense of the Congress that NSF's Mathematics and Science Partnership program and a similarly named program at the Department of Education are complementary, not duplicative. The Administration requests FY2009 funding NSF's MSP program at a level below that authorized in the America COMPETES Act. Why?

Answer: The FY 2009 Budget provides sustained funding for the Math and Science Partnership (MSP) programs at both the Department of Education ($179 million) and the National Science Foundation ($51 million). Although both MSP programs facilitate partnerships between local school districts and institutions of higher education aimed at improving math and science education, the Education Department component is a formula program that provides money to states (which

in turn sponsor funding competitions), whereas the NSF component is a nationally competitive program. Although the two programs share the same name and similar goals, there is an appropriate role for each agency in developing, assessing and disseminating effective instructional materials and methods to students across the country. The Administration will ensure that evaluation principles developed by the ACC are reflected in both programs and that these complementary programs coordinate their activities, as appropriate, to meet their shared goals.

With respect to the MSP program within NSF, the increase proposed for MSP is not negligible. In fact it goes up by $2.5 million, more than a 5 percent increase from FY 2008, to a total of $51.0 million. The increase will make possible several new partnerships, including new Teacher Institutes for the 21st Century. The MSP program is not the only one in the EHR portfolio that contributes to teacher education. The DR-K12 program does so through the research it supports on teaching and learning. The Louis Stokes Alliances for Minority Participation (LSAMP) program and Tribal Colleges and Universities Program (TCUP) include activities for attracting diverse talent to STEM teaching. The Robert Noyce Teacher Scholarship program offers scholarships and support for STEM majors who seek teaching careers. The Graduate Teaching Fellowships in K-12 Education program (GK-12) gives graduate students in STEM contact with the pre-college sector and enlarges the resources available to K-12 teachers.

Climate Change

The budget document indicates that some $2.015 billion is proposed for climate change science programs. Please provide by agency, each program, project or activity, the amount provided in FYs 2007 and 2008, the amount proposed in FY 2009.

Answer:

CLIMATE CHANGE SCIENCE PROGRAM:
FY 2007-2009 BUDGET BY AGENCY

[DISCRETIONARY BUDGET AUTHORITY IN $M]

Agency	FY07 Actual	FY08 Enacted	FY09 Requested
USDA	61	65	62
DOC	236/1	266	325
DOE	126	128	146
HHS	47	47	47
DOI	27	34	31
DOT	1	1	2
EPA	16	20	16
NASA	1,084	1,078	1,204
NSF	207	205	221
SI	6	6	6
USAID	14	14	20
Total Research	**1,825**	**1,864**	**2,080**

/1 The FY 2007 amount of $236M reflects an estimate of climate expenditures. This number has been revised upward to reflect actual expenditures of $265M in FY 2007.

In addition, please include by agency, each program, project or activity, the amount provided in FYs 2007 and 2008, the amount proposed in FY 2009 that directly indirectly support climate change (e.g., climate change education programs at NSF).

Answer:

CCSP[1]	**FY 2007 Actual Budget Authority**	**FY 2008 Enacted Budget Authority**	**FY 2009 Proposed Budget Authority**	**Change in Budget Authority 2008-2009**
Department of Agriculture				
Agricultural Research Service	40	39	37	-2
Cooperative State Research, Education and Extension Services	2	4	6	2
Economic Research Service[2]	0	0	0	0
Forest Service – Forest and Rangeland Research	19	22	19	-3
Subtotal – USDA[3]	**61**	**65**	**62**	-3
Department of Commerce				
National Oceanic and Atmospheric Administration – Operations, Research, and Facilities[4]	229	254	239	-15
National Oceanic and Atmospheric Administration – Procurement, Acquisition, and Construction[4, 5]	7	7	81	74
National Institute of Standards and Technology (NIST)[6]	---	5	5	0
Subtotal – DOC[3]	**236**	**266**	**325**	59
Department of Energy				
Science – Biological & Environmental Research[3,7]	**126**	**128**	**146**	18
Department of Health and Human Services				
National Institutes of Health[3]	**47**	**47**	**47**	0
Department of the Interior				
U.S. Geological Survey – Surveys, Investigations, and Research[3]	**27**	**34**	**31**	-3
Department of Transportation				
Federal Highway Administration – Federal-Aid Highways[3,8]	0	1	0	-1
Federal Aviation Administration – Research, Engineering, and Development[9]	0	0	2	2
Federal Transit Administration - Research and University Research Centers[10]	0	0	0	0
Subtotal – DOT[3]	**1**	**1**	**2**	1
Environmental Protection Agency				
Science and Technology[3]	**16**	**20**	**16**	-4
National Aeronautics and Space Administration[11]				
Science, Aeronautics, and Exploration[3]	1,084	1,078	**0**	-1078
Science	0	0	1,204	1204
Subtotal-NASA	**1,084**	**1,078**	**1,204**	126
National Science Foundation				
Research and Related Activities[3]	**207**	**205**	**221**	16

CCSP	FY 2007 Actual Budget Authority	FY 2008 Enacted Budget Authority	FY 2009 Proposed Budget Authority	Change in Budget Authority 2008-2009
Smithsonian Institution				
Salaries and Expenses[3]	6	6	6	0
U.S. Agency for International Development				
Development Assistance[3]	14	14	20	6
Total[3]	**1,825**	**1,864**	**2,080**	**216**

FOOTNOTES

[1] All data supersede numbers released with the 2009 President's Budget. Budget Authority provided in millions of dollars. Discrepancies resulted from rounding and improved estimates.

[2] Funding for the Economic Research Service is less than $500,000 for all years shown.

[3] Agency subtotals and table total may not add due to rounding.

[4] NOAA previously reported its climate research activities to CCSP, which were included under its Office of Oceanic and Atmospheric Research (OAR) line office and the National Marine Fisheries Service (NMFS) line office starting in FY 06. For FY 08, NOAA made a decision to report activities for the NOAA climate strategic goal, as defined in the NOAA strategic plan (2005), to ensure consistent reporting and provide the most accurate picture of its climate funding to date. The climate goal includes both research and operations funding under the following offices: OAR, NMFS, the National Weather Service, and the National Environmental Satellite, Data, and Information Service.

[5] Past reports have erroneously presented all of NOAA's CCSP funding in the Operations, Research, and Facilities (ORF) account. Climate-related activities have been and continue to be funded in both the ORF account and the Procurement, Acquisition, and Construction (PAC) account.

[6] 2008 funding is for new measurement and standards-related activities that NIST will undertake to support CCSP.

[7] The majority of the 2009 increase is due to increased climate modeling efforts. Examples include testing new convection and cloud parameterization schemes, research on effects of improved initialization of coupled model components on decadal predictability of climate, and understanding the role of cryospheric processess in the climate system.

[8] The 2006, 2007 and 2009 funding for Federal Highway Administration – Federal-Aid Highways was less than $500,000.

[9] The 2006, 2007 and 2008 funding for Federal Aviation Administration – Research, Engineering, and Development was less than $500,000.

[10] Federal Transit Administration - Research and University Research Centers is FTA's support for DOT's Center for Climate Change. The 2006 through 2009 funding amounts for this program are less than $500,000.

[11] NASA has revised the set of programs and projects it counts as supporting CCSP goals. Beginning in 2006, the funding levels presented do not include the Ground Network and Research Range assets or Congressional interest items but comprise activities not previously counted, including the NPOESS Preparatory Project, portions of the Landsat Data Continuity Mission (LDCM), and the Gravity Recovery and Climate Experiment (GRACE), as well as portions of the High-End Computing and Scientific Computing projects.

CCTP[1]	FY 2007 Actual Budget Authority	FY 2008 Enacted Budget Authority	FY 2009 Proposed Budget Authority	Change in Budget Authority 2008-2009
Department of Agriculture				
Natural Resources Conservation Service – Carbon Cycle	1	1	1	0
Forest Service R&D – Inventories of Carbon Biomass	1	1	1	0
Agricultural Research Service – Bioenergy Research	2	2	2	0
Cooperative State Research, Education and Extension Service - Biofuels/Biomass Research, Formula Funds, National Research Initiative[2]	3	8	27	19
Forest Service – Biofuels/Biomass, Forest and Rangeland Research	2	2	2	0
Rural Business Service – Renewable Energy Program	23	36	0	-36
Rural Business Service – Value Added Producer Grants	3	5	0	-5
Rural Business Service – Biomass R&D, Section 9008 Farm Bill[3]	14	0	0	0
Office of the Chief Economist - Methane to Markets[4]	0	0	0	0
Research Education, Economics Area - Bioenergy and Biobased Products Research Initiative (mandatory funding)[5, 6]	---	50	50	0
Forest Service - Forest Wood to Energy (mandatory funding)[5, 7]	---	15	15	0
Rural Business Service – Renewable Energy Systems and Energy Efficiency Grants (mandatory funding)[5, 8]	---	50	50	0
Rural Business Service – Renewable Energy Systems and Energy Efficiency Loans (mandatory funding)[5, 8]	---	21	21	0
Rural Business Service - Biomass R&D, Section 9008 (mandatory funding)[5, 9]	---	15	15	0
Subtotal - mandatory funding[10]	14	151	151	0
Subtotal - discretionary funding[10]	34	54	33	-21
Subtotal – USDA[10]	**48**	**205**	**184**	**-21**
Department of Commerce				
National Institute of Standards and Technology (NIST) – Scientific and Technological Research and Services	6	6	6	0

CCTP	FY 2007 Actual Budget Authority	FY 2008 Enacted Budget Authority	FY 2009 Proposed Budget Authority	Change in Budget Authority 2008-2009
NIST – Industrial Technical Services, Advanced Technology Program[11]	16	0	0	0
International Trade Administration – Operations and Administration[12]	0	2	2	0
Subtotal – Commerce[10]	**22**	**8**	**8**	**0**
Department of Defense				
Research, Development, Test and Evaluation, Army	69	74	16	-58
Research, Development, Test and Evaluation, Navy	13	39	11	-28
Research, Development, Test and Evaluation, Air Force	13	36	104	68
Research, Development, Test and Evaluation, Defense-wide – DARPA[14]	6	0	0	0
Research, Development, Test and Evaluation, Defense-wide – Office of the Secretary of Defense	0	0	0	0
Subtotal – DOD[10,13]	**101**	**150**	**131**	**-19**
Department of Energy				
Energy Efficiency and Renewable Energy[15,16]	1,411	1,722	1,255	-467
Electricity Delivery and Energy Reliability[15]	120	130	122	-7
Nuclear Energy[17]	513	685	879	194
Fossil Energy R&D – Efficiency and Sequestration[18]	493	611	744	133
Science – Fusion, Sequestration, and Hydrogen[19]	487	499	833	334
Innovative Technology Loan Guarantee Program[20]	7	5	0	-5
Departmental Administration – Climate Change Technology Program Direction[21]	1	1	2	1
Subtotal – DOE[10]	**3,032**	**3,652**	**3,835**	**183**
Department of Transportation				
National Highway Traffic Safety Administration[22]	1	1	0	-1
Research and Innovative Technology Administration – Research and Development	1	1	1	0
Federal Transit Administration - Research and University Research Centers and Formula and Bus Grants[23]	16	18	19	1
Subtotal – DOT[10]	**17**	**19**	**20**	**1**

CCTP	FY 2007 Actual Budget Authority	FY 2008 Enacted Budget Authority	FY 2009 Proposed Budget Authority	Change in Budget Authority 2008-2009
Environmental Protection Agency				
Environmental Programs and Management	92	90	87	-3
Science and Technology	13	18	11	-7
Subtotal – EPA[10]	**105**	**108**	**98**	**-10**
National Aeronautics and Space Administration[24]				
Science, Aeronautics, and Exploration	**139**	**139**	**117**	**-22**
National Science Foundation				
Research and Related Activities	**21**	**21**	**23**	**2**
Total[10]	**3,485**	**4,303**	**4,416**	**114**

FOOTNOTES FOR FINAL REPORT

[1] All data supersede numbers released with the 2009 President's Budget. Budget Authority provided in millions of dollars. Discrepancies resulted from rounding and improved estimates.

[2] The FY 2008 level includes increased funding for research in cellulosic ethanol.

[3] Though initially run through the Natural Resources Conservation Service, the Biomass R&D, Section 9008 Farm Bill program was transferred at the end of FY 2006 to the Rural Business Service. The program activities, historical funding levels, and treasury account number remain the same.

[4] The Methane to Market partnership is a new initiative for the Office of the Chief Economist in FY 2008.

[5] These are mandatory programs proposed in the Administration's Farm Bill. The Farm Bill has not been enacted for 2008, however funding is included in this column assuming the Administration's Farm Bill is passed in 2008.

[6] This new program will advance scientific knowledge for the improved production of renewable fuels and biobased products.

[7] This new program will be used to accelerate development and use of new technologies to more productively utilize low-value woody biomass resources, offsetting the demand for fossil fuels and improving forest health.

[8] The discretionary funding for the renewable energy program has historically been and continues to be included in this report. The program is proposed for reauthorization in the 2007 Farm Bill proposals and the associated mandatory funding has been included here.

[9] The discretionary funding for the Biomass R&D program has historically been and continues to be included in this report. The program is proposed for reauthorization in the 2007 Farm Bill proposals and the associated mandatory funding has been included here.

[10] Agency subtotals and table total may not add due to rounding. All data supersede numbers released with the 2009 President's Budget. Discrepancies resulted from rounding and improved estimates.

[11] The 2007 Budget authority, obligations, and outlays for NIST's Advanced Technology Program are less than $500,000. The program has been proposed for elimination in 2008.

[12] The Department of Commerce provided funding in this account for the Asia-Pacific Partnership on Clean Development and Climate beginning in 2008.

[13] The 2008 enacted budget authority funding represents Congressional action on the 2008 budget and includes earmarks that are not proposed for extension in the 2009 President's Budget request.

[14] The reduction in DARPA funding from 2007 to 2008 represents the natural conclusion of an R&D program to investigate the use of waste materials to produce electricity for military installations.

[15] In 2008, Congress enacted a new account structure. In 2007, funding for these programs was provided in the Energy Supply and Conservation account. 2008 and 2009 funding is provided in the new accounts listed.

[16] The Reduction from 2008 Enacted to the 2009 Budget level is largely due to the elimination of Congressional earmarks and other terminations and redirections, including a reduction in facilities construction funding.

[17] Funding levels do not include the MOX facility. The 2009 Budget includes increases in funding over the 2008 enacted levels for the Advanced Fuel Cycle Initiative/Global Nuclear Energy Partnership and Nuclear Power 2010 programs. The 2008 Budget includes increases in funding over the 2007 enacted levels for the Generation IV Nuclear Energy Systems Initiative and Nuclear Power 2010 programs.

[18] This activity supports research, development and demonstration of technologies that capture and store carbon dioxide and improve efficiency to reduce greenhouse gas emissions at coal power plants and industrial coal facilities

[19] The increases in funding from 2008 to 2009 in Science – Fusion, Sequestration, and Hydrogen reflect increased support for programs that are all included within the American Competitiveness Initiative, and are for the most part also included within the Advanced Energy Initiative, including increases to the international ITER fusion project, and for areas identified in the "Basic Research Needs" for energy technologies series of workshops.

[20] This is a new program in 2007. Administrative expenses are reported to establish a loan guarantee office. In 2009 and thereafter, administrative costs will be fee funded, so there is no net cost to the government.

[21] The increase in 2009 reflects additional funding for modeling and analysis improvements.

[22] The 2009 Funding for the National Highway Traffic Safety Administration was less than $500,000.

[23] Section 3045 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU) establishes a National Fuel Cell Bus Technology Development Program (NFCBP). The NFCBP's goal is to facilitate the development of commercially viable fuel cell bus technologies and related infrastructure to reduce fossil fuel dependence and emissions from bus transportation. These grants were funded for the first time in 2006.

[24] NASA's 2006 funding level increased markedly from the 2006 level reported in the last report due to Congressional direction to increase the budget for the Fundamental Aeronautics Program budget, NASA's major contributor to CCTP funding. The drop from the 2007 enacted level to the 2008 proposed level reflects differences of opinion between the Congress and Administration concerning the level at which the Fundamental Aeronautics Program should be funded.

Summary of Climate Expenditures[1]	FY 2007 Actual Budget Authority	FY 2008 Enacted Budget Authority	FY 2009 Proposed Budget Authority	Change in Budget Authority 2008-2009
Climate Change Science Program (CCSP)	1,825	1,864	2,080	216
Climate Change Technology Program (CCTP)[2]	3,485	4,303	4,416	114
International Assistance[3]	188	202	657	455
Energy Tax Provisions That May Reduce Greenhouse Gases[4,5]	1,520	1,520	1,440	-80
Total[3,6]	7,004	7,875	8,573	699

[1] Data supersede numbers released with the President's 2009 Budget. Budget Authority provided in millions of dollars. Discrepancies resulted from rounding and improved estimates.

[2] As comparable 2001 funding has not been generated for the CCTP, the 2001 amount shown for CCTP reflects estimated data for DOE and EPA only.

[3] The International Assistance total contains funds that are also counted in the Climate Change Science Program total. Table total line excludes this double-count.

[4] Tax incentives related to climate change included in this report are currently projected at about $6.0 billion over five years (2009-2013).

[5] Tax expenditures are estimates of the revenue losses due to a tax preference. While not exactly equivalent to budget authority, obligations or outlays, tax expenditure estimates have been included in all columns for completeness.

[6] Table total may not add due to rounding.

International Assistance[1]	FY 2007 Actual Budget Authority	FY 2008 Enacted Budget Authority	FY 2009 Proposed Budget Authority	Changes in Budget Authority 2008-2009
Department of State				
Diplomatic and Consular Affairs	3	4	4	0
Economic Support Fund[2, 3]	32	32	37	5
International Organizations and Programs	6	5	5	0
Subtotal – State[4]	**41**	**41**	**46**	**5**
Department of the Treasury[5]				
Debt Restructuring – Tropical Forestry Conservation	20	20	20	0
Global Environment Facility[6]	26	26	26	0
Clean Technology Fund	0	0	400	400
Subtotal – Treasury[4]	**46**	**46**	**446**	**400**
U.S. Agency for International Development[2]				
Andean Counterdrug Initiative[7]	0	0	0	0
Assistance for Eastern Europe and the Baltic States	3	11	11	0
Assistance for the Independent States of the Former Soviet Union	5	15	15	0
Development Assistance	89	81	130	49
Economic Support Fund	0	7	7	0
International Disaster Assistance	2	2	2	0
P.L.-480 Title II Food Aid	0	0	0	0
Subtotal – USAID[4]	**100**	**115**	**165**	**50**
Total[4]	**188**	**202**	**657**	**455**

FOOTNOTES

[1] All data supersede numbers released with the 2009 President's Budget. Budget Authority provided in millions of dollars. Discrepancies resulted from rounding and improved estimates.

[2] USAID is currently restructuring its planning, budgeting and reporting methods and electronic applications. Strategic Objectives that were reported for FY 2006 may not track consistently into elements reported for FY 2007 , FY 2008, and FY 2009. Estimates for global climate change (GCC) program funding (as a subset of total element funding) are reported here and may change as the restructuring and reform process is completed. Some GCC program activities may not appear in this table at this time and may be added in future accounting.

[3] The increase in the Economic Support Fund in 2007 reflects funding for the Asia-Pacific Partnership on Clean Development and Climate.

[4] Agency subtotals and table total may not add due to rounding.

[5] The 2007 President's Budget included funding for climate-related activities through the Asian Development Bank. That funding was not appropriated in this account. Therefore, that account has been deleted.

[6] The 2009 Budget provides $80 million for GEF. Of this amount, a portion will be allocated to programs related to climate change.

[7] The Andean Counterdrug Initiative account was added in the fiscal year 2004 report to reflect new counter-deforestation activities in Peru.

Energy Tax Provisions That May Reduce Greenhouse Gases

(Fiscal Years -- Dollars in Millions)

	2007	2008	2009	2010	2011	2012	2013	2009-2013
New technology credit (without coal)[1]	410	800	990	1,020	1,000	990	960	4,960
Tax credit and deduction for clean-fuel burning vehicles	260	150	130	-20	-50	-60	-50	-50
Exclusion of utility conservation subsidies	120	120	120	110	110	110	110	560
Credit for holding clean renewable energy bonds	20	40	70	70	70	70	70	350
Allowance of deduction for certain energy efficient commercial building property	190	170	90	30	0	0	0	120
Credit for construction of new energy efficient homes	20	30	20	10	0	0	0	30
Credit for energy efficiency improvements to existing homes	380	150	0	0	0	0	0	0
Credit for energy efficient appliances	80	0	0	0	0	0	0	0
Credit for residential purchases/ installations of solar and fuel cells	10	10	10	0	0	0	0	10
Credit for business installation of qualified fuel cells[2]	30	50	10	-10	-10	-10	-10	-30
TOTAL	**1,520**	**1,520**	**1,440**	**1,210**	**1,120**	**1,100**	**1,080**	**5,950**

[1] Estimates of revenue loss from coal provisions have been removed from the tax expenditure estimate in the budget.

[2] Estimates of revenue loss from the micro-turbine provision have been removed from the tax expenditure estimate in the budget.

The Climate Change Science Program (CCSP) was re-oriented by President Bush in 2002 toward an objective of providing scientific information by the end of 2007 to policy-makers to "evaluate optimal strategies to mitigate climate change risks." Of the 21 Synthesis and Assessment Products due originally by the end of 2007 from the CCSP, one was released in 2006, three in 2007, 12 are scheduled for 2008 and five for 2009. The Climate Change Technology Program (CCTP) was largely a collection of already existing programs, primarily in the Department of Energy. For the CCTP, participating officials and observers have differed in opinion regarding whether the research should give greater emphasis to technologies that could be available in the near- to medium-term, or those available in 2030 or later. How well have the CCSP and the CCTP met their milestones and deadlines to deliver information needed by decision-makers in the public and private sectors? More precisely, with the benefit of hindsight, did these programs correctly identify the information that decision-makers needed, what information would be possible to obtain, and did the CCSP and CCTP successfully acquire and communicate the information?

Answer: The Synthesis and Assessment Products (SAPs) were designed to satisfy the requirements of section 106 of the Global Change Research Act (GCRA) and were the result of a public process during the 2002 Climate Change Science Program's (CCSP) Planning Workshop for Scientists and Stakeholders. CCSP believed that the approach and timeline it had outlined with the 21 SAPs represented an essential and prudent approach to producing assessments for policy makers and the requirement for producing a Scientific Assessment. Given the complexity of these reports, however, the timeline was proven to be unrealistic and as a result many of the SAPs' deadlines had to be extended. The CCSP timeline for producing the SAPs, however, has now been superseded by an August 2007 ruling by the U.S. District Court in California. The court ruled the CCSP would have until May 31st to release a new Scientific Assessment.

The CCSP is committed to producing the Scientific Assessment required by Section 106 of GCRA by the deadline set by the Court. At the same time, CCSP is still producing the SAPs and expects to have all 21 reports completed by the end of 2008. Of the SAPs identified earlier as specifically complying with the Scientific Assessment requirement, those products are on schedule and will be incorporated into the Scientific Assessment. The Assessment has undergone peer review and is now in final clearance with the release scheduled on or before the May 31st deadline.

In addition to producing the Scientific Assessment, CCSP is also producing a Unifying Synthesis Product that integrates the 21 SAP reports and puts them in a context with the results from the Intergovernmental Panel on Climate Change Fourth Assessment Report and other recent studies that have appeared in the scientific literature. By doing so, it will provide a single coherent analysis of the current understanding of climate change science, summarize the contributions of the CCSP Program, and identify important gaps in the science. The primary objective of the CCSP is to provide the best possible scientific information to support public discussion along with government and private sector decision-

making on key climate-related issues. These products will help to provide that information.

The Climate Change Technology Program (CCTP) has successfully acquired and communicated relevant information to policymakers. The CCTP reports regularly to the undersecretary-level Committee on Climate Change Science and Technology Integration. The *CCTP Strategic Plan* released in fall 2006 provides a comprehensive, long-term look at the nature of the climate change challenge and its potential solutions. It defines clear and promising roles for advanced technologies by grouping technologies for near-, mid- and long term deployment. It also outlines a process and criteria for setting priorities by organizing and aligning Federal climate change R&D. It discusses in detail the climate change technology portfolio, with links to individual technology roadmaps and goals. Many CCTP activities build on existing work, but the Administration also has expanded and realigned some activities and launched new initiatives in key technology areas to support the CCTP goals. For example, the President's National Climate Change Technology Initiative (NCCTI) identified 12 discrete activities that could advance technologies to avoid, reduce, or capture and store greenhouse gas emissions on a large scale. These activities received funding increases from FY2006 to FY2008.

How have the CCSP and the CCTP engaged public and private decision-makers, in order to assess their needs for information about climate change? Is this assessment available to the public?

Answer: There is no formal assessment except for the Strategic Plan itself, which is the product of extensive public interaction. In addition, the National Research Council has provided additional guidance on these topics.

The CCTP has published a Strategic Plan that describes its vision and goals, as well as the potential contributions of new technologies to address climate change under various global scenarios. Following public release of the draft Strategic Plan, the CCTP hosted a series of public workshops that led to numerous constructive comments, which were incorporated into the final Plan. The CCTP has also identified within its portfolio a subset of priority R&D activities. In 2009, the CCTP will continue to focus on implementing the Strategic Plan through its interagency working groups.

The 21 Synthesis and Assessment Products (reports) were announced as being the key outputs from the science program. Why are these Products so far behind schedule? In terms of content, are these reports succeeding in telling us which uncertainties have been reduced – the objective of the science strategy set in 2003? Which uncertainties have been most significantly reduced?

Answer: Many of the authors of the SAPs also participated in the writing and negotiation of the IPCC reports completed during 2007. The United States provided more of the scientific content of the IPCC reports than any other country.

The CCSP led synthesis and assessment work described in these SAP reports has, in many cases, reduced key uncertainty that limited our understanding of, and ability to document, climate change. The outcomes from a number of the already completed SAPs also served as key inputs to the Intergovernmental Panel on Climate Changes (IPCC) Fourth Assessment Report, contributing importantly to the success of the IPCC.

A significant and specific example of a high impact outcome can be found in the work of SAP 1.1, which examined the temperature trends in the lower atmosphere, and was successful in helping the climate science community understand and reconcile troubling differences in the global temperature data sets recorded at the surface and in the lower, middle, and upper atmosphere. This was a key step in allowing the IPCC to increase their certainty for the attribution of the warming of the last 50 years to the forcing from anthropogenic greenhouse gases from their prior conclusion of "likely" to "very likely" in this most recent Fourth assessment.

The *CCTP Draft Strategic Plan* received over 250 comments from the public. These comments were carefully reviewed by the interagency working groups of the CCTP and incorporated, as appropriate, into the final document.

What have you learned from the overall climate change science and technology strategies and the challenges in getting expected results from these programs? Do you have suggestions for Congressional action or the next Administration?

Answer: The Climate Change Science Program has been very successful in identifying and addressing key scientific questions under the five goals identified during the planning process:

Goal 1: Extend knowledge of the Earth's past and present climate and environment, including its natural variability, and improve understanding of the causes of observed changes

Goal 2: Improve understanding of the forces bringing about changes in the Earth's climate and related systems

Goal 3: Reduce uncertainty in projections of how the Earth's climate and environmental systems may change in the future

Goal 4: Understand the sensitivity and adaptability of different natural and managed systems to climate and associated global changes

Goal 5: Explore the uses and identify the limits of evolving knowledge to manage risks and opportunities related to climate variability and change

We suggest continuing this rigorous research program and increase emphasis on Goal 4 and Goal 5 while maintaining a strong research program on Goals 1 through 3.

The Office of Science and Technology Policy is one of several organizations, within the Executive Office of the President and across federal agencies, charged with review and coordination responsibilities for the CCSP and the CCTP. The current organization was designed to place accountability with the 13 agencies involved in those initiatives, not with the White House or the interagency coordinating bodies. A host of interagency working groups meet to communicate and coordinate agency programs, with mixed reviews from external observers. Several proposals have been launched in the 110th Congress to improve the perceived coordination and management problems; options include establishing a new central management entity or providing funds directly to OSTP or the CCSP Office to try to leverage changes in the agencies. What has worked well in the organization and coordination of the Climate Change Science Program and the Climate Change Technology Programs over the past seven years? What are the weaknesses of the current organization and responsibilities? What would you recommend to the Congress or the next Administration as improvements to the organization and processes?

Answer: Management of interagency research programs is inherently difficult. The legal authority for budget and planning lies within each agency. Funds cannot be appropriated to interagency bodies that are not accountable for budgetary management processes. Therefore, interagency programs convene participating agencies to set priorities and develop plans, but the implementation of those plans must be integrated into the budget and planning processes within each agency. A centralized budget is not an option.

Successful interagency programs rely on careful planning by willing agencies in close coordination with the OMB budget examiners for each agency.

As current research yields its results, how do you envision that resource needs may shift among science questions, technologies, and programs to implement mitigation or adaptation? In your view, will future revisions of strategies likely involve significant shifting of resources across agencies that have different missions? How and why?

Answer: The need for resources to address Goals 1, 2 and 3 of the CCSP Strategic Plan is greater than ever. Although we have made progress in understanding the physical science of climate change, we cannot yet project or forecast climate change processes on the local or regional scale. This work must continue.

At the same time, there is new ability and an increased need to address the scientific questions surrounding impact and adaptation. New scientific players, such as land management agencies and states, must become active participants in assessing and addressing the impacts of climate change. This challenge should not be met by taking research funds from other parts of the program, but by increasing resources

which are available for addressing these questions at a level that is consistent with the proposed budget.

How do you anticipate that the negotiation and implementation of such changes would occur, especially across agencies? What are the likely obstacles to evolution and migration of relative responsibilities across agencies? Is the current decentralized responsibility sufficient, or is there need for greater management and perhaps some more centralized funding to effect changes?

Answer: Coordination, rather than centralization, is effective and the only practical solution to large interagency efforts such as climate change science. Reorganizing disparate research efforts into a single management unit is not practical or necessary. Strong coordination, however, based upon the willing participation of the agencies, can meet the needs for a coherent integrated science program.

Social Sciences

The National Science and Technology Council is scheduled to release a repot on the grand challenges for the social, behavioral, economic sciences disciplines. What are the major findings of the report?

Answer: The findings will be made available when the report is finalized.

Are the science directorates' budgets for fiscal year 2009 for NSF appropriate given the findings of the report? Are adjustments necessary this year? If not, when are such adjustments appropriate?

Answer: Since the findings have not been completed or finalized we do not know if they will have an impact on the budget.

When is the report to be released?

Answer: The report is in the final stages but there is no deadline yet for its release.

Questions for the Record

From: Congressman Aderholt
To: CJS Subcommittee
Re: OSTP Hearing
Date: February 26, 2008

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1. When reading the Administration's budget for FY09, I was disappointed that the Administration did not request adequate funding for the Ares launch vehicle to return the program to a 2014 launch date. As you know, the original expected launch date was 2014 until the 2007 CR cut funding, which pushed the launch date back to 2015. Considering the hazard of relying on the Russians to provide space transportation after the Shuttle is retired in 2010, why did the Administration not request adequate funding to return the expected launch date to 2014?

Answer: While NASA continues to aim for an initial flight of the Orion Crew Exploration Vehicle and its associated Ares I launch vehicle in 2014 or perhaps even earlier, it is our understanding that NASA believes the most likely date for the first flight (given its experience with roughly comparable development efforts) is March 2015 as noted above. The President's FY2009 budget request for NASA, which increases exploration funding by 13 percent, supports NASA's current Orion/Ares program development plans in terms of achieving an initial flight by this March 2015 date.

With regard to budgetary resources, it is important to note that the Vision for Space Exploration calls for a "sustained and

affordable" program of space exploration, and the Administration's approach has been for NASA to proceed with exploration activities and missions as it can afford to pay for them. At the same time, an over-arching Administration goal with respect to NASA is to maintain sufficiently robust programs (in the context of program requirements and Presidential priorities) across the range of NASA mission areas and activities, including not only human spaceflight activities but also areas such as Earth and space science and aeronautics. The President's FY2009 budget request is consistent with this objective, calling for a total of $17.61 billion (a 2.9% increase over the FY2008 enacted level), with almost a third of this amount allocated to science activities.

Our view is that this request reflects a strong commitment by the Administration both to the exploration vision and a vigorous NASA science program, while also seeking to reinforce the foundational R&D capabilities necessary for long-term technical excellence and success in aeronautics. In light of this over-arching budgetary objective and other non-NASA fiscal demands, the Administration considers the amount requested for NASA exploration activities, as well as for NASA overall, to be appropriate and reasonable.

. Although the Ares I is well on its way to completion, I am concerned that not enough has been done to ensure that the Ares V is available by 2020. As you know, the Ares V will allow launching much larger and more powerful satellites as well as lunar landers. Why does development of the Ares V not begin until FY11 in the Administration's budget?

Answer: NASA has phased its technology development activities in support of the Vision for Space Exploration according to 1) the times at which it believes capabilities are most needed and 2) the availability of funds within NASA's current five-year budget projection. The Ares V does not represent a near-term requirement within NASA's overall exploration plans for activities relating to the Vision, thus its development is being pursued later than the Ares 1 launch vehicle and Orion Crew Exploration Vehicle (for which development is ongoing and which NASA believes should be operational first in support of U.S. human spaceflight activities). Further, the funding for Ares V development is expected to come in large part from that portion of NASA's budget that currently is allocated for Space Shuttle support and operations. As such, the funds available for Ares V development activities will increase dramatically following the retirement of the Space Shuttle in 2010. In light of these factors, FY2011 is an appropriate and sensible time at which to pursue the development of the Ares V launch vehicle in earnest, and OSTP is generally comfortable with this development plan.

WEDNESDAY, FEBRUARY 27, 2008.

NATIONAL SCIENCE BOARD/NATIONAL SCIENCE FOUNDATION

WITNESSES

DR. STEVEN BEERING, CHAIRMAN, NATIONAL SCIENCE BOARD
DR. ARDEN L. BEMENT, JR., DIRECTOR, NATIONAL SCIENCE FOUNDATION

CONGRESSMAN MOLLOHAN'S OPENING REMARKS

Mr. MOLLOHAN. The hearing will come to order. Welcome. Glad to see everybody was able to get in and get settled. We appreciate your attendance.

Welcome to Dr. Beering and to Dr. Bement. This Subcommittee looks forward to your testimony here today on the budget request for the National Science Foundation and our nation's strategic direction in the area of science research.

The budget request for the National Science Foundation is a mixed bag. On the one hand, it is an exciting day for the Foundation. The budget request from the President proposes a total of over $6.8 billion, an increase of over 13 percent from the enacted level.

The budget request puts the Foundation back on the doubling path outlined in the American Competitiveness Initiative.

That sounds good on the one hand. However, on the other, the budget request falls far short of the levels authorized for the Foundation and the American COMPETES Act, some $472 million below the authorized level in fiscal year '09.

The Congress approved this funding level in response to the findings contained in the report, "Rising Above the Gathering Storm, Energizing and Employing America for a Brighter Economic Future."

The report noted that the scientific and technological underpinnings, critical to the United State's economic leadership, are being weakened at a time when our international competitors, led by China's emergence, are enjoying large and sustained increases in GDP.

COMPETES response to that threat. Dr. Beering, your recent companion piece to the Digest of Key Scientific and—of science and engineering indicators notes these trends.

Some have expressed concerns about the priorities that the Foundation is setting. Funding requested for research and related activities grows by 16 percent. While the major research, equipment, and facilities construction account is cut over 33 percent, deleting funding for many ongoing projects and denying any new construction starts.

Similarly, while education and human resources is slated to get an increase of almost nine percent, the Foundation's budget for education is some $200 million below the authorized levels. Critical to respond to the challenges of educating qualified math and science professional and K through 12 programs, they are slated for cuts in real terms, programs like STEM Talent Expansion Program, the Advanced Technology Program, and the Noyce Teachers Scholarships.

In keeping with the Administration's emphasis on the mathematical and physical sciences, engineering and computer sciences, each see an approximate 20 percent increase over fiscal year 2008, while the biological sciences receive a 10 percent increase. Social and behavioral and economic sciences see an 8.5 percent increase.

Although the COMPETES Act does not assume that all fields receive equal increases each year, the law does call on the Foundation not to disinvest in the biological and social sciences over the longer term.

So there is some anxiety about this. And we look forward to hearing about the research priorities presented to the Committee this year by the Board and the Foundation.

For EPSCoR, the budget proposes $113.5 million for fiscal year 2009. We look forward to talking with you, Dr. Bement, about EPSCoR about why the Foundation has chosen to disregard the Congressional direction to fund the EPSCoR program and the Noyce Scholarship Program at the levels specified in the conference report accompanying 2008.

And we look forward to your testimony and that explanation and working with you on that as we go forward, not on this appropriation but with the implementation of the 2008 bill.

Thank you both for appearing today. We look forward to your testimony. And before we proceed further, I call on Mr. Frelinghuysen.

CONGRESSMAN FRELINGHUYSEN'S OPENING REMARKS

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman, and good morning to all of you. Please to join the Chairman in welcoming you, Dr. Beering, Dr. Bement to the hearing today.

You are here today to testify in your fiscal year 2009 budget request for the National Science Foundation. As I mentioned to Dr. Marburger, the President's Science Advisor, yesterday, it is clear that science is at the very top of the Administration's budget priorities.

The National Science Foundation request for fiscal year 2009 totals $6.85 billion, an increase of 13 percent from the enacted 2008 level.

I am very pleased to see this level of commitment to funding basic scientific research and to maintaining our leadership in science and technology.

It will be very difficult to provide increases of that magnitude given the many competing priorities and limited resources. But it is reassuring that you are being aggressive in requesting the resources.

Let me say that I also associate myself with the Chairman in terms of the Augustine report, The Gathering Storm. That should never remain on the shelf. That should be always a goal for us to shoot towards.

I look forward to your testimony today. And I will have a number of questions. And may I associate myself with just about all the remarks of the Chairman about the American Competitiveness Initiative and your efforts to improve science and technology education.

Let me just take this opportunity, Mr. Chairman, I know that you have been to Antarctica, to express my thanks to Dr. Bement and the National Science Foundation for including me as part of the group that was involved in the opening of the new South Pole Station.

I wouldn't call the trip a life-altering trip. But in reality it did alter my view of the world. And gave me an incredible respect for the work that is being done there. And I know it is being done. Other types of scientific research is being done in other parts of the world.

I had a very, very positive impression. And what impressed me the most is the number of young people, maybe because I am over 60. But the dedication. And you have seen it. The dedication of the men and women there and in other parts of the world. This is obviously one of the most inhospitable, yet most interesting places. The dedication—the true dedication of the workforce there, which is enlarged during the summer and shrinks during the winter. But I want to thank you and your staff for making that trip a remarkable trip. And I came away with a huge respect, a much greater respect, for the work of those who work with you.

So thank you very much. And thank you, Mr. Chairman.

Mr. MOLLOHAN. Gentlemen, again, welcome to the hearing. Your written statements will be made a part of the record. And if you would proceed with your oral statements and summarize in any order that you wish. Thank you.

Dr. BEMENT. Would you like to——

Mr. MOLLOHAN. Do you have a preference, if not, we will call on Dr. Beering.

DR. BEERING'S OPENING REMARKS

Dr. BEERING. Okay. Thank you. Good morning. Chairman Mollohan, Ranking Member Frelinghuysen and members of this Subcommittee, I appreciate the opportunity to address you today.

I am Steven Beering. And I am the Chairman of the National Science Board. I am honored to represent the 24 members of our Board before you today. I would like to thank the members of this Subcommittee for your long-term commitment and support of the National Science Foundation and our investments in the portfolio of research and education.

We also applaud your strong bipartisan support for legislation over the past year that will bolster the U.S. leadership in science and technology, including the American COMPETES Act.

The National Science Board and the broader science and engineering community are disappointed, however, by the actual appropriations in the fiscal year 2008 Omnibus Bill, which erased most of the anticipated increases in support of research.

In such an uncertain funding climate, we are concerned with the signal it sends to our potential partners in the National Science Foundation, but also the message to international and American students who may be deterred from pursuing science and engineering careers in this country.

As many other countries invest heavily in science and engineering research, graduate a record number of scientists and engineers, and increase incentives to attract outstanding international students and scholars, it is a dangerous time for the United States to neglect our science and engineering enterprise.

The National Science Board is committed to helping this country maintain our leadership in science and technology. In addition to its policy and oversight role at NSF, the Board has also addressed a number of significant policy issues for U.S. science and engineering.

Let me cite a few. We are working with NSF to implement recommendations in several recent research and education reports, including the national action plan for addressing the critical needs of U.S. science, technology, engineering, and mathematics education system, our STEM report.

Moving forward to improve engineering education.

Hurricane warning, the critical need for a national hurricane research initiative.

Enhancing support for transformative research at the National Science Foundation and science and engineering indicators, which includes the digest of key science and engineering indicators. And a companion piece policy statement entitled "Research and Development: Essential Foundation for U.S. Competitiveness in a Global Economy."

We will be introducing an additional report in March entitled "International Science and Engineering Partnerships: A Priority for U.S. Foreign Policy and our Nation's Innovation Enterprise."

And we just a few weeks ago began an in-depth study of renewable energy issues, which will be ongoing this year.

In response to the American COMPETES Act, the Board has undertaken a number of actions. We recently sent reports to Congress to make recommendations on NSF policies regarding cost sharing and on preconstruction and management and operation cost coverage under the major research equipment and facilities construction account.

And we will be preparing a final report for Congress on this subject later this year.

The report is also—the Board is also reviewing the impacts of NSF policies on interdisciplinary research and on limiting the number of proposals for institution of high education for some awards. The Board will report back to Congress on both of these issues by August 2008.

Finally, the Board will evaluate a pilot program for grants for new investigators at NSF and report these findings to Congress by August 10.

For fiscal year 2009, the request for the National Science Board is $4.03 million, an increase of 1.5 percent over the fiscal year 2008 budget.

Next year's budget will allow the Board to strengthen its oversight and policy duties for NSF and to provide independent scientific advice for the President and Congress.

In addition, the Board will continue to increase communication and outreach with all of its stakeholders. For example, we continue to engage with numerous stakeholders to implement recommendations from our STEM education action plan.

The National Science Board supports the fiscal year 2009 budget for NSF and for basic science research in other agencies of the President's request, so that we can begin to make up for the opportunities that we will miss this year under the 2008 Omnibus Appropriations Bill.

You have my pledge on behalf of the Board that we will continue to work closely with the NSF Director to ensure that funding decisions continue to provide maximum returns on the taxpayers' investment in our Nation's future.

Thank you very much.

[The written statement of Dr. Steven Beering, Chairman, National Science Board follows:]

Testimony of
Dr. Steven Beering, Chairman
National Science Board

Before the House Appropriations Committee
Subcommittee on Commerce, Justice, Science and Related Agencies
February 27, 2008

Chairman Mollohan, Ranking Member Frelinghuysen and Members of the Committee, I appreciate the opportunity to address you today. My name is Steven Beering, and I am the Chairman of the National Science Board. I am honored to represent the twenty-four members of the National Science Board before you today.

On behalf of the entire National Science Board[1], I would like to thank the Members of this Subcommittee for your long-term commitment in support of the National Science Foundation and its investments in a broad portfolio of research and education in science, technology, engineering, and mathematics. We also applaud your strong bipartisan support for legislation over the past year that will bolster U.S. leadership in science and technology, including the passage of H.R. 2272, the America COMPETES Act, last August. The science and engineering communities were also encouraged to see that this committee recommended increases in funding for basic scientific research in the

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[1] *The National Science Board was established by Congress in the National Science Foundation Act of 1950 to oversee the activities of the National Science Foundation and to serve as an independent advisory body to the President and Congress on national policy issues related to science and engineering research and education. The twenty-four members of the board are national leaders in diverse areas of science and engineering research and education from around the country, who are nominated by the President and confirmed by the Senate to serve six-year terms. The NSF Director also serves as an ex-officio member of the Board.*

Commerce, Justice, Science, and Related Agencies Appropriations Act last year. With the President and Congress in agreement about the importance of science and engineering research and education for U.S. innovation and competitiveness, the stakeholders in scientific research and education looked forward to advances in discovery and innovation that would be enabled by the promised budget increases.

The National Science Board and the broader science and engineering community were surprised and disappointed by the actual appropriations in the fiscal year 2008 omnibus bill, which erased most of the anticipated increases in support for research. Now, instead of expanding research activities as planned, we are confronted with the possibility of layoffs for outstanding researchers in our National Laboratories and the frustrating reality that our Federal research funding programs will be forced to turn away many innovative ideas that would have received awards if funding had been in keeping with the objective of doubling over 10 years for NSF, National Institute of Science and Technology in Department of Commerce, and the Office of Science at the Department of Energy.

The 2008 omnibus bill has significantly impacted the National Science Foundation's mission to support basic research in the United States. The 1.3 percent increase in the research and related activities budget is below the rate of inflation, and thus represents a decline in support for these activities. If the FY 2008 omnibus were in line with the budget doubling that was supported by the President's American Competitiveness Initiative and the America COMPETES Act, NSF estimates that they would have been able to award 1000 more grants and 230 more graduate research fellowships this year. NSF has also shelved several program solicitations that were planned for 2008, including a new program in Computer and Information Science and Engineering for the development of a competitive workforce and the Office of Polar Programs' program on Climate Change and Changing Seasonality in the Arctic program.

In such an uncertain funding climate, we are concerned with the signal this sends to our potential partners in international science projects but also the signal sent to international and American students who may be deterred from pursuing science and engineering careers in this country. As many other countries invest heavily in science and engineering research, graduate a record number of scientists and engineers, and increase incentives to attract outstanding international students and scholars, it is a dangerous time for the U.S. to neglect our science and engineering enterprise.

Although the United States is still the world leader in science, technology, and engineering, the findings of the National Science Board and of many other eminent bodies representing a wide range of perspectives, from think tanks, industry, academia, and government, indicate that urgent and sustained action is required to maintain our leadership. During these difficult economic times, when industry may be forced to cut back basic research investments for short-term survival, it is particularly critical for the federal government to ensure our innovative capacity through basic research and workforce training in science and engineering. The American public agrees: the National Science Board's *Science and Engineering Indicators 2008* reports that according to the most recent NSF survey, in 2006, public support for federal investments in basic scientific research is at its highest level since inception of the survey in 1979.

Overview of National Science Board Activities in FY 2007-2008

The National Science Board is committed to helping this country maintain our leadership in science and technology. Over the past year, in its oversight role for NSF, it has reviewed and endorsed the Office of Inspector General's Semi-annual Reports to Congress and approved the NSF management response; we approved the Foundation's Budget Submission for transmittal to OMB; reviewed the Foundation's annual Merit Review Report; and provided review and decisions on major awards or proposal funding requests for 13 awards, with a total approved funding of over $1.08 billion.

The Board also addressed a number of significant policy issues for U.S. science and engineering, in accord with our statutory mission—far more than I will have time or space to describe here. I would like to briefly outline the Board's conclusions from a number of reports it has issued, and also to present and our priorities for the upcoming year.

First, I will highlight some of our major accomplishments, including those activities that specifically addressing Congressional concerns.

NSF Oversight and Policy Directions

Science, Technology, Engineering and Mathematics (STEM) Education- The Board is working with NSF to implement recommendations in several recent education reports. In October, the Board released *A National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, Engineering, and Mathematics Education System* in response to a request from Congress. The report outlines a number of actions that local, state, and federal stakeholders can take to improve the nation's STEM education system. In that report, the Board first recommends greater coherence in the STEM education system, vertically across grade levels and horizontally across States. The second priority recommendation is to ensure that students are taught by well-prepared and highly effective teachers. A number of NSF programs are identified specifically as contributing to the development of human capital in the science and engineering workforce, including STEM teachers. These include Louis Stokes Alliance for Minority Participation (LSAMP), Research Experiences for Undergraduates (REU), the Robert Noyce Scholarship program, and the Math and Science Partnerships program as examples of NSF programs that prepare effective teachers. We are pleased to see that the budget provides additional funds for MSP, the Noyce Scholarship and other programs that contribute to the Board's objectives for the STEM teaching workforce.

Another report, *Moving Forward to Improve Engineering Education,* recommended a number of actions for NSF to build upon its innovative programs in engineering education to attract, retain, and train American engineers from diverse backgrounds to meet domestic needs and growing international competition.

Transformative Research – Occasionally in the course of scientific research endeavors, a new finding revolutionizes a field or creates new subfields of discovery. The willingness of review panels to take risks on potentially transformative proposals is an area of continual attention at the National Science Foundation in keeping with its mission to support discovery through funding basic research. We recognize that risk aversion in recommendations for funding by review panels is likely to decrease as funding becomes increasingly competitive. However, we also recognize that our nation can not afford to miss out on revolutionary ideas. Therefore, the Board formed a task force on transformative research, which issued a report last May entitled *Enhancing Support of Transformative Research at the National Science Foundation.* In the report, the Board recommends that NSF implement a Transformative Research Initiative, and is currently working with the NSF to implement this recommendation.

Implementation of the America COMPETES Act - In response to the America COMPETES Act, the Board has undertaken a number of actions. The Board recently sent reports to Congress to make recommendations on NSF policies regarding cost sharing and on preconstruction and management and operations cost coverage under the Major Research Equipment and Facilities Construction (MREFC) account, and will be preparing a final report for Congress on this subject this year. To briefly summarize the findings of these reports:

- The National Science Board has statutory responsibility for the oversight of activities funded from the MREFC account. It is a substantial challenge to prioritize and manage MREFCs, and the Board is exploring the best solution for ensuring solid analyses of science needs, construction costs, and operations and maintenance (O&M) costs in the "MREFC process" and to define how the Board can contribute in the oversight process. In particular, the Board recommends that better estimates of lifetime costs be obtained in the pre-construction planning phase of a project.
- A 2004 NSB policy eliminated the cost sharing requirement for research grants and cooperative agreements. The Board recommends changes in the 2004 cost

sharing policy, including reinstatement of mandatory cost sharing for certain programs.

I would be happy to meet with you at a later date to elaborate on the Board's policy activities or respond to any questions concerning any or all of these important policy concerns.

The Board is also reviewing the impacts of NSF policies on interdisciplinary research and on limiting the number of proposals per institution of higher education for some awards. The Board will report back to Congress on both of these issues by August 2008. Finally, the Board will evaluate a pilot program of grants for new investigators at NSF and report the findings to Congress by August, 2010.

Advice to the President and Congress

Science & Engineering Indicators – One of the highlights of the year was the recent release of *Science and Engineering Indicators 2008*, which the Board transmits to the President and Congress every even numbered year. It is the most comprehensive series of indicators on the state of the U.S. science and engineering enterprise in a global context. The 2008 Indicators tell a mixed story. A sample of findings include:

- The U.S. is the largest, single, R&D-performing nation in the world supplying an estimated $340 billion for R&D in 2006, a record high. However, Federal obligations for all academic research (basic and applied) declined in real terms between 2004 and 2005 and are expected to drop further in 2006 and 2007. This would be the first multiyear decline for Federal support for academic research since 1982.
- Basic research accounted for 18 percent of total R&D, or $62 billion. The federal government supplied about 60 percent of all basic research funds, industry about 17 percent, with private foundations, academic institutions and other governmental entities supplying the rest.
- U.S. grade school students continue to lag behind other developed countries in science and math, although fourth and eighth grade U.S. students showed steady

gains in math since 1990. Only fourth graders showed gains in science compared to 1996.

- The U.S. sustained a relative economic advantage over other developed and developing economies. The U.S. is a leading producer in high-tech manufacturing and knowledge-intensive services, but several Asian countries, led by China, have rapidly increased their global market share. The U.S. comparative advantage in exports of high-technology products has eroded: the U.S. trade balance in advanced technology products shifted from surplus to deficit starting in 2002. Information and communications products geographically concentrated in Asia -- particularly China and Malaysia -- account for this deficit.
- U.S. public support for government funding of scientific research is strong and growing. In a 2006 survey, 87 percent of Americans supported government funding for basic research, up from 80 percent in past surveys dating back to 1979. Also, Americans who said the government spends too little on scientific research grew from 34 percent to 41 percent between 2002 and 2006.
- Diversity has increased in the academic science and engineering labor force. From 1973 to 2006, in the academic, doctoral labor force the share of women increased from 9 percent to 33 percent, of underrepresented minorities (African-Americans, Hispanics, and American Indians/Alaska Natives) from 2 percent to 8 percent, and of Asian/Pacific Islanders from 4 percent to 14 percent.

Along with Science and Engineering Indicators 2008, the Board has prepared two additional reports: *Digest of Key Science and Engineering Indicators 2008* and a Companion Piece policy statement: *Research and Development: Essential Foundation for U.S. Competitveness in a Global Economy.* The first report was developed to encourage broad use of Indicators data. It includes a set of 20 important indicators, and is structured for ease of understanding and to provide linkages to more extensive discussions and data in the main Indicators volumes that are related to the selected indicators. The second, Companion Piece, report expresses Board concerns with industry and Federal investment in U.S. R&D, especially basic research and academic research, and offers recommendations on improving our understanding of global trends in industrial science and technology and implications for the U.S. economy and jobs.

International Partnerships

The Board's Task Force on International Science conducted a series of roundtable discussions and meetings to examine the role of the U.S. government in international S&E partnerships. The task force prepared a report on their findings, which was approved at the December 2007 meeting and will be released in March 2008. The report, *International Science and Engineering Partnerships: A Priority for U.S. Foreign Policy and Our Nation's Innovation Enterprise (NSB-08-4),* recommends that the U.S. strengthen S&E partnerships with other countries.

The NSF Office of International Science and Engineering should be more active in encouraging international partnerships between NSF funded Principal Investigators and scientists and engineers in other countries, especially developing countries. In a global world, such partnerships enable us to leverage growing basic research investments in other countries. For example, partnerships would help to share costs of research on common global challenges such as sustainable energy, climate change, natural disasters, disease pandemics, and the fight against terrorism. In addition, the Board believes that S&E partnerships could be utilized more broadly for diplomacy. We also would like to see more formal, high level cooperation in S&E among Federal agencies through NSTC. Opinion polls show that countries with very unfavorable views of the U.S. in general still overwhelmingly admire U.S. science and technology. For example, scientific collaborations with Russia improved goodwill between the countries after the Cold War and helped to ensure that nuclear technology was adequately protected; collaborations with countries such as Iran could serve a similar purpose today.

Hurricane Research – Hurricanes account for over half of total weather-related damage in the U.S. Stimulated by the devastation after Hurricane Katrina, the National Science Board convened a Task Force on Hurricane Science and Engineering. In January of 2007, it unveiled the National Hurricane Research Initiative (NHRI) in the report, *Hurricane Warning: The Critical Need for a National Hurricane Research Initiative.* The proposed

NHRI would establish highly focused priorities that involve industry, academia, and government in addressing research gaps and in applying research findings to operations that could help us to mitigate the destructive impacts of future hurricanes.

FY 2009 Budget Request

National Science Foundation

The National Science Board reviewed and approved the FY2009 budget request that was submitted to the Office of Management and Budget. The Board supports the President's budget request. The $6.85 billion request represents an increase of nearly $789 million, or 13 percent, above FY2008 levels. The request is the first step toward doubling the budgets of several agencies including NSF, the National Institute of Science and Technology, Department of Commerce, and the Office of Science, Department of Energy, over 10 years and is critical for realizing the goals of the bipartisan competitiveness agenda that will help to maintain U.S. leadership in scientific and engineering research and education.

The NSF already receives many more outstanding research proposals that we can fund, so I assure you that the budget increase will be put to good use. The proposed 13 percent budget increase will provide funding for 1,370 more outstanding research proposals and 3,075 more Graduate Research Fellowships to support our most promising young American scientists – tomorrow's innovators. Support for graduate education is one of NSF's fundamental responsibilities. The Board continues to examine the best ways to financially support the future generation of scientists and engineers during graduate education. Although it is clear that financial support in any form—whether scholarship, assistantship, or traineeship--is important for success in graduate school, the Board continues to consider how the mechanisms for support contribute to the achievement of a range of objectives for graduate education, including adaptations to ensure American scientists and engineers can compete with scientists and engineers from around the world.

National Science Board

For FY 2009, the request for the National Science Board is $4.03 million, an increase of $61,000, or 1.5 percent, over the FY 2008 estimate of $3.97 million. The FY 2009 budget will allow the Board to strengthen its oversight and policy duties for NSF and to provide independent scientific advice for the President and Congress. In addition, the Board will continue to increase communication and outreach with universities, industry, the science and engineering research community, Congress, federal science and technology agencies, and the public. For example, we continue to engage with numerous stakeholders to implement recommendations from our STEM education action plan.

This year, the Board will continue to expand our role in approving MREFC projects, address the topic of sustainable energy through a series of roundtables, review the NSF cost sharing policy, review the impact of multiple proposals on institutions, and analyze support for interdisciplinary research. In addition, by August 2010, the Board will submit to Congress a report of findings and recommendations on the NSF pilot program of grants for new investigators that was established by the America COMPETES Act.

The Board also has been reexamining the policy for recompetition and renewal of awards at NSF. In 1997, the Board approved a statement on competition, recompetition, and renewal of NSF awards. The Board assessed the implementation of the statement, and issued a statement to reaffirm the 1997 statement at their last meeting. The Board endorses strongly the principle that all expiring awards, including major facility awards, are to be recompeted, and believes that peer-reviewed competition and recompetition is the process most likely to assure the best use of NSF funds for supporting research and education.

One of the most significant activities over the next two years is to plan content for *Science and Engineering Indicators 2010* and to consider whether we should prepare a second round of the *Digest of Key Science and Engineering Indicators* (that was pilot tested with Indicators 2008) for the *2010* volume of *Indicators*. The Board is already soliciting input on the 2008 Indicators and Digest to determine how we can improve the 2010 version to address the concerns of the various communities who rely on this comprehensive and objective set of data to craft policies that foster discovery and innovation through science and engineering. We will also be presenting the findings of our policy Companion Piece to Indicators to a range of stakeholder audiences to discuss possible responses to our recommendations. To this point we have held two rollout events for Indicators 2008, on Capitol Hill and at the Chamber of Commerce. We have held additional discussions with spokespersons from the Department of Commerce and with the members of the Government-University-Industry Research Roundtable at the National Academies on data issues and policy concerns highlighted in our Companion Piece, *Research and Development: Essential Foundation for U.S. Competitiveness in a Global Economy.*

A priority for the Board during the upcoming year is sustainable energy. In October 2007, the Board established the Task force on Sustainable Energy to address the science and engineering challenges related to sustainable energy. The Task Force held the first of a series of roundtable discussions earlier this month on the role of the Federal government, businesses, non-profits, and other U.S. stakeholders in addressing the S&E challenges of sustainable energy. The Task Force will continue to meet with stakeholders in order to inform a forthcoming report that will contain recommendations for implementing a nationally coordinated initiative in S&E research and education for sustainable energy.

Closing Remarks

The Board strongly recommends that Congress fund in full the President's budget request for the National Science Foundation and for basic scientific research at other agencies. Amidst the great economic and political uncertainty of the moment, the importance of research and development for innovation and economic growth is undeniable. NSF-funded research and education provides the foundation for American scientific and technological greatness. The economic growth and the quality of life that we enjoyed in the 20th century were made possible in large part by technological discoveries and innovations. In addition, we need science and engineering advances more than ever to tackle some of the greatest challenges that we have ever faced, including climate change, national security, and sustainable energy production.

I understand that investments in science and technology compete with a host of other funding priorities. Though it might be tempting to forego the long-term investments in the face of short-term challenges, neglecting scientific research and education now will have serious consequences for the future of our country. We must bear in mind that investments in our scientific and technological workforce, infrastructure, and basic research are not luxuries – they are critical for long-term prosperity and security. As other countries now actively seek to emulate our success by building their own innovation infrastructures, we must be ever vigilant to enhance our own innovative capacity.

Based on the President's budget request and the appropriations bill from this committee last year, it appears that both parties of Congress and the White House appreciate the importance of scientific research and education for our country. The National Science Board urges you to fund the FY 2009 budget for NSF and for basic science research in other agencies at the President's request, so that we can begin to make up for the opportunities that we will miss this year under the FY 2008 omnibus appropriations bill. You have my pledge on behalf of the Board that we will continue to work closely with the NSF Director to ensure that funding decisions continue to provide maximum returns on the taxpayers' investment in our nation's future.

Mr. MOLLOHAN. Thank you. Dr. Bement.

DR. BEMENT'S OPENING REMARKS

Dr. BEMENT. Yes, thank you. Chairman Mollohan, Ranking Member Frelinghuysen, and members of this Subcommittee, I am pleased to present the National Science Foundation's budget for the 2009 fiscal year.

NSF proposes an investment of $6.85 billion to advance the frontiers of science and engineering research in education.

Our budget request includes an increase of $789 million or 13 percent over fiscal year 2008. This increase is necessary to put NSF back on the course that was charted by the American COMPETES Act and the President's American Competitiveness Initiative.

This budget reflects the Administration's continued resolve to double overall funding for the NSF within ten years.

Let me begin by expressing by sincere appreciation of this Subcommittee's support of the American COMPETES Act. I would also like to thank you for recognizing the importance of our agency operations and award management account in the 2008 Omnibus Appropriation.

Our stewardship activities allow us to serve award recipients with tools such as the new grants management website, research.gov.

The timing of this testimony coincides with a period of economic uncertainty in our country. I have come here today to tell you that an investment in the National Science Foundation is an investment in America's economic security.

NSF provides the two essential ingredients of a healthy, high-tech economy: Basic research discoveries and a highly trained workforce.

For over 50 years, NSF has been the foundation of innovation, fostering great ideas and the great minds who discover them. NSF discoveries have led to many of the technological innovations you and I take for granted today.

And yet for fiscal year 2008, NSF's budget increase fails to keep up with inflation. By contrast, other nations of the world are steadily increasing their investments in STEM education and basic research and development.

I assure you that multi-national companies will have no problem relocating their operations to the countries where they can find the best trained workforce and the latest research ideas.

The world is changing. Lead times for new products are shrinking. Now more than ever, basic research discoveries are essential to keeping the wheels of innovation turning in America's high-tech companies.

It is not merely enough to maintain the federal R&D investment status quo. It is our solemn obligation to keep up with corporate America's demand for innovative people and ideas.

At NSF, we are responsive to emerging potentially transformative ideas of research. I would like to highlight some of our new cost cutting multi-disciplinary initiatives. We created these initiatives in response to inputs we received from the research communities we serve.

We request $100 million to continue cyber-enabled discovery and innovation. Our bold two-year initiative, to apply revolutionary computational tools and concepts to all fields of science engineering and education.

Our request includes $20 million for Science and Engineering Beyond Moore's Law. This initiative aims to position the United States at the forefront of communications and computation. Moving us beyond the limitations of current systems.

We are requesting $15 million to fund Adaptive Systems Technology. Our new effort aimed at using all aspects of biological science to inspire transformative new technologies.

Our request of $10 million for the Dynamics of Water Processes in the Environment initiative, will bring together researchers from various disciplines to enhance our ability to understand the complexities of fresh water systems at regional and local levels.

In addition to our ongoing efforts in transformative research, we believe that a truly competitive workforce is one that reflects the full potential and diversity of the American people themselves.

Our efforts to broaden participation in science and technology target students at all educational levels and from all geographic areas.

We train the Nation's skilled workforce by providing research opportunities for undergraduates, graduate students, and post-docs. We research and evaluate effective STEM curricula for the Nation's K to 12 classrooms. And provide opportunities for teacher education.

And we develop innovative programs for informal science and technology learning for students young and old in museums, through the mass media, and through other outreach activities that touch the imaginations of millions of Americans.

Mr. Chairman, time does not permit me to describe the other numerous activities NSF sponsors to strengthen and support our Nation's science and technology research and education.

NSF's relatively small size relies on its catalytic impact on all sectors of the economy. I am hard pressed to think of another example in which the taxpayers derive such a tremendous return on investment.

Thank you for extending me the invitation to speak with this Subcommittee today. And I look forward to answering your questions.

Thank you.

[The written statement of Dr. Arden L. Bement, Jr., Director, National Science Foundation follows:]

Testimony of
Dr. Arden L. Bement, Jr., Director
National Science Foundation

Before the House Appropriations Committee

Subcommittee on Commerce, Justice, Science and Related Agencies

February 27, 2008

Chairman Mollohan, Ranking Member Frelinghuysen, and Members of the Subcommittee, I am pleased to present the National Science Foundation's budget for the 2009 fiscal year.

The National Science Foundation (NSF) proposes a fiscal year 2009 investment of $6.85 billion to advance the frontiers of research and education in science and engineering. Our budget request includes an increase of $789 million – or 13 percent – over the current fiscal year 2008 amount. This increase is necessary to put NSF back on the course that was charted by the President's American Competitiveness Initiative (ACI) and by the America COMPETES Act. This year's budget reflects the Administration's continued resolve to double overall funding for the ACI research agencies within 10 years.

An investment in the National Science Foundation is a direct investment in America's economic security. In fact, without a solid basic research foundation for our high-tech economy, no economic security is possible. Basic research underpins all of the technology that constitutes the lifeblood of today's global market. America's sustained economic prosperity is based in part on technological innovation resulting from previous fundamental science and engineering research. Innovation and technology are engines of the American economy, and advances in science and engineering provide the fuel.

While the United States still leads the world in its level of public and private R&D investment, our counterparts around the globe are well aware of the importance of funding R&D. A string of recent reports have found evidence that China is rapidly accruing global technological standing, including an OECD finding that China was set to become the second-highest investor in R&D among world nations in 2006, behind only the United States.[1,2,3] Over the last two decades, U.S. federal support of research in the physical sciences, mathematics, and engineering has been

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[1] http://www.oecd.org/document/26/0,2340,en_2649_201185_37770522_1_1_1_1,00.html
[2] http://www.tpac.gatech.edu/hti2007/HTI2007ReportNSF_012208.pdf
[3] http://www.nsf.gov/statistics/nsf07319/pdf/nsf07319.pdf

stagnant when adjusted for inflation. As a percentage of GDP, the U.S. federal government has halved its investment in physical science and engineering research since 1970. Conversely, the Chinese government has more than doubled its GDP percentage expenditure in R&D since 1995.[3]

More than a dozen major studies have now concluded that a substantial increase in federal funding for basic scientific research is critical to ensure the preeminence of America's scientific and technological enterprise.

Just recently, Norman Augustine, former CEO of Lockheed Martin, released a follow-up to "The Gathering Storm" report entitled, "Is America Falling Off the Flat Earth?" His message is clear: "Unless substantial investments are made to the engine of innovation – basic scientific research and development – the current generation may be the first in our country's history to leave their children and grandchildren a lower sustained standard of living."[4]

For over fifty years, NSF has been a steward of the nation's science and engineering enterprise. NSF investments in discovery, learning, and innovation have been important to increasing America's economic strength, global competitiveness, national security and overall quality of life.

With its relatively small size, NSF delivers an enormous "bang for the buck" of federal government research and development (R&D) investment. NSF represents just four percent of the total federal budget for research and development, but accounts for a full fifty percent of non-life science basic research at academic institutions. NSF is the research funding lifeline for many fields and emerging interdisciplines at the frontiers of discovery. In fact, NSF is the only federal agency that supports all fields of basic science and engineering research.

NSF relies on a merit-based, competitive process that is critical to fostering the highest standards of excellence and accountability – standards that have been emulated at other funding agencies around the world.

NSF Supports American Innovation

The Foundation of Innovation

NSF often funds a technology in its earliest stages, frequently before other agencies or industries get involved. NSF funding was involved in the developmental phase of the technology used in magnetic resonance imaging (MRI) now ubiquitous in diagnostic medicine, the research that led to the development of silicon-coated glass used in flat panel displays, and the early investigations that led to green and blue light-emitting diodes used in cell phone displays and traffic lights. In 1952, Caltech professor Max Delbruck used one of NSF's first grants to invent molecular biology techniques that enabled one of his students, James Watson, to discover the molecular structure of DNA, and another Nobel laureate, David Baltimore, to unravel some of its mysteries.

In a more recent example, NSF CAREER awardee Jay Keasling, now the head of the NSF-sponsored Synthetic Biology Engineering Research Center at the University of California-

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[4] Augustine, Norman. Is America Falling off the Flat Earth? National Academies Press

Berkeley, and two postdoctoral researchers from his lab founded Amyris, a company that is taking a revolutionary approach to chemical manufacturing by harnessing metabolic processes in microorganisms. Through genetic engineering, the researchers "program" the microbes to churn out useful chemicals, bypassing traditional, more expensive methods. Amyris has engineered a strain of yeast that can produce large quantities of artemisinic acid, a precursor to a compound found naturally in a plant that fights malaria but is currently in short supply. Amyris is also developing a fermentation process to deliver a biofuel gasoline substitute. NSF funding of the early research conducted at Berkeley enabled the discoveries that led to this promising new company, named 2007 "Business Leader of the Year" by *Scientific American* magazine.

NSF as an agency is itself the origin of transformative practices. One new NSF innovation is Research.gov, which is fulfilling our vision of a seamless interface between government funding agencies and the investigators we support. Research.gov is a one-stop shop, where researchers can go to manage their existing portfolio of grants and explore new opportunities. Research.gov is a tool that streamlines the process of applying for federal grants, making it easier and more cost-effective for the federal government to serve its customers.

Educating Tomorrow's Workforce

Beyond all of our efforts to advance the frontiers of knowledge and spur innovation, NSF is dedicated to educating and training the nation's skilled labor force. NSF plays a role in science, technology, engineering, and math (STEM) education at every educational level. Our contribution to education may ultimately be NSF's most profound and meaningful legacy.

The scientists, technologists, engineers, and mathematicians trained through NSF's integration of research and education transfer the latest scientific and engineering concepts from universities directly to the entrepreneurial sector when they enter the workforce.

Our graduate research fellowship (GRF) program has supported several notable technologists and scientists early in their professional training. Prominent economist Steven Levitt, co-author of the popular book *Freakonomics*, was an NSF GRF recipient from 1992 to 1994. Sergey Brin, co-founder of Google, was an NSF graduate research fellow in the mid-1990s when he began thinking about how to create an internet search engine. NSF's GRF program is as old as the foundation itself, and gives young scientists an early career charge, allowing them to go on to greatness. At least three Physics Nobel Prize winners are former NSF GRF recipients. We are extremely pleased with the proposed $29 million increase in the GRF program's funding for fiscal year 2009 which will enable us to fund an additional 700 promising young American investigators. A recent article from the National Bureau of Economic Research suggests that an increase in the number of GRF awards would help to supply an increased demand for talented individuals in the American science and technology workforce that will result from an increase in R&D spending.[5]

At some point in their careers, nearly 200 Nobel Prize-winning scientists received NSF funding for research in chemistry, physics, medicine, and economics. And scores of NSF-supported scientists shared a measure of the 2007 Nobel Peace Prize as members of the United Nation's Intergovernmental Panel on Climate Change.

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[5] Freeman, Richard. The Market for Scientists and Engineers. *NBER Reporter*, 2007 No. 3, pp. 6-8.

To strengthen the educational institutions that benefit from NSF awards, the Directorate for Education and Human Resources (EHR) program, Innovation through Institutional Integration (I^3), challenges institutions to think strategically about the creative integration of NSF-funded awards. This provides the opportunity for NSF-grantees at particular institutions to cooperate and share a common vision for improved educational excellence at their institution.

America COMPETES Act Compliance

The America COMPETES Act contains several requirements for NSF. We are actively processing those directives and devising plans to implement them in a timely manner. In the FY 2009 request, activities that overlap with the President's American Competitiveness Initiative receive top priority. These priority areas do include strong links to other fields, and our request includes across-the-board increases for all directorates.

We are currently evaluating how to best ramp up the Robert Noyce Teacher Scholarship Program to bring an infusion of talented teachers into the nation's K-12 education system. To launch such a large-scale program, we will carefully evaluate what we need to do to maximize its societal impact and success. We will apply what we have learned from our other successful scholarship programs to ensure the program is administered in the best possible way.

We are also working how best to evaluate grant applicants' plans for training undergraduates, graduate students, and postdocs in responsible and ethical conduct of research. A number of our programs including our Centers and the Integrative Graduate Education and Research Traineeship (IGERT) program already contain ethics components. We will add a new certification requirement for institutions, which will require the institution to have a plan in place to provide appropriate training and oversight in the responsible and ethical conduct of research for all undergraduates, graduate students, and postdocs participating in the NSF-funded research project.

Open access to research results is an essential component of a strong and healthy scientific enterprise. We currently make available the citations of NSF-funded research on both the NSF website and on Research.gov. To further the goal of disseminating the results of NSF-funded research, we will develop revised reporting guidelines for NSF principle investigators (PIs). These guidelines will enable the PIs to summarize the key accomplishments of their NSF-funded work, including scientific findings, student training, and professional development activities. This information will be made available on the NSF website.

2009 Budget Request Highlights

At NSF, we understand that new discoveries are the main driving force behind societal progress. As the nation's premier funding agency for basic research, our mission is to advance the frontiers of knowledge, where high-risk, high-reward research can lay the foundation for revolutionary technologies and tackle complex societal problems. The NSF budget for 2009 reflects this vital agenda, and I'm pleased to present it to you today.

Let me begin with the big picture. As noted earlier, the President is requesting $6.85 billion for the NSF in FY 2009. That's an increase of almost $789 million, or 13 percent above the current 2008 appropriated amount. While it seems like a large increase, this level is necessary to fulfill the President's vision for physical science and basic research set forth in the American Competitiveness Initiative. The FY 2009 request is squarely in line with the goal of doubling of ACI research agency budgets over 10 years. This increased investment will reinforce NSF's leadership in basic science and engineering and allow us to preserve America's preeminence in the global technology economy.

In this year's proposed budget, funding levels increase for every major NSF appropriations account. Research and Related Activities investments increase by 16 percent, and our Education and Human Resources account is increased by 8.9 percent. We need rapid progress in these areas to stimulate the discoveries in research we need to maintain our standing in the global marketplace, and to keep our students engaged and ready to perform in the global workforce. Our budget includes increases for every Directorate and Office within NSF.

Here are highlights of some of the key investments we are emphasizing in our 2009 budget.

Cyber-enabled Discovery and Innovation
Cyber-Enabled Discovery and Innovation (CDI) is expected to create revolutionary science and engineering research results using "computational thinking" – thinking that encompasses all possible computational concepts, methods, models, algorithms, and tools. Computational thinking is relevant to all fields of science, engineering and education, and promises to have a profound impact on our nation's ability to generate and apply new knowledge. We expect CDI research to produce paradigm shifts in our understanding of a wide range of science and engineering phenomena, and we anticipate socio-technical innovations to create new wealth and enhance the national quality of life. By investing in CDI, NSF continues its leadership in enabling the United States to preserve its role as the world leader in information technology.
Requested Funding Level: $100 million

Science and Engineering Beyond Moore's Law
"Moore's Law" refers to the empirical observation made in 1965 by Intel co-founder Gordon Moore that the speed of computer processing based on semiconductor integrated circuits doubles about every 18 months. With current silicon technology, we expect to reach the physical and conceptual limits of Moore's Law within 20 years. If we are ever to solve the computational challenges inherent in today's great scientific questions, we must find a way to take computing power and communications beyond Moore's Law. To get there, we'll need entirely new scientific, engineering, and conceptual frameworks. Fundamental research across many disciplines will be called upon to deliver the new hardware, architectures, algorithms, and software of the computers of tomorrow.
Requested Funding Level: $20 million

Adaptive Systems Technology
Recent progress in probing the secrets of biological systems has been explosive. We are only just beginning to see the application of these new and transformational discoveries to the development of engineered systems, especially at the interface between human and machines. We call our new interdisciplinary endeavor – research at the convergence of human and mechanical systems – Adaptive Systems Technology (AST). New applications and technologies

resulting from AST have already demonstrated substantial economic potential. Artificial retinas and cochlea, electronic language translators, and smart hand-held electronics are just a handful of the products that have already come to market at the human-machine interface. NSF's broad portfolio encompasses the diverse research areas involved in this new interdisciplinary effort. Biologists uncover nature's progression from simple to complex nervous systems; physicists and chemists explain the fundamental processes underlying complex neural organization and communication pathways; mathematicians, computer scientists and cognitive scientists explore how systems compute; learning and behavioral scientists provide insights into how organisms learn and adapt to their environment; while engineers allow the design, analysis and construction of systems that mimic living nervous system networks. By working together, these scientists and engineers can benefit from the knowledge and experience of experts in other fields, developing new concepts through collaboration and idea-sharing.
Requested Funding Level: $15 million

Dynamics of Water Processes in the Environment

This activity will build upon NSF's considerable track record on fundamental water research, while utilizing our unique ability to cross disciplinary boundaries to bring together the separate communities of researchers working on the varying aspects of water science. Water is fundamental to every economic activity in the country, and yet, we do not have a full understanding of the effects of human interventions and changing environmental conditions on the availability and quality of fresh water. The economic driving forces for understanding water processes are compelling: droughts alone cause average damages of $6 to $8 billion dollars annual in the United States. Understanding water dynamics is also essential to understanding climate and environmental change. NSF's investment in Dynamics of Water Processes in the Environment will enhance our ability to understand complex freshwater systems at regional and local levels, taking advantage of advanced observation networks, cyberinfrastructure, and integrated databases.
Requested Funding Level: $10 million

National Nanotechnology Initiative

NSF leads the U.S. nanotechnology research effort, and we remain strongly committed to supporting this vital emerging industry. Our goal is to support fundamental research and catalyze synergistic science and engineering research and education in emerging areas of nanoscale science and technology. We are also committed to research directed at the environmental, health, and safety impacts of nanotechnology. Novel materials, devices, and systems – with their building blocks designed on the scale of nanometers – open up new directions in science, engineering, and technology with potentially profound implications for society. With the capacity to control and manipulate matter at this scale, science, engineering, and technology are realizing revolutionary advances in areas such as individualized pharmaceuticals, new drug delivery systems, more resilient materials and fabrics, catalysts for industry, and order-of-magnitude faster computer chips.
Requested Funding Level: $397 million

Climate Change Science Program

Scientists predict that the climate of the earth is changing rapidly, and we have much to learn about how climate affects human activities, how human activities affect climate, and what we can do to protect human life and health in the face of disruptive climate events. The Climate Change Science Program (CCSP) was established in 2002 in response to the challenge of understanding climate and climate variability. Science-based knowledge is absolutely essential to our ability to predict the changes that are likely to take place, and devise informed plans to mitigate the negative impacts of climate change on humanity. The CCSP engages thirteen U.S. agencies in a concerted interagency program of basic research, comprehensive observations, integrative modeling, and development of products for decision-makers. Consistent with the FY 2009 Interagency Implementation Priorities memo, NSF provides support for the broad range of fundamental research activities that form a sound basis for other mission-oriented agencies in the CCSP, and the nation at large.

Building on our agency's particular strengths, NSF encourages interdisciplinary activities and focuses particularly on Earth system processes and the consequences of change. Our priorities include the management of enormous amount of data necessary for accurate global change modeling and research, the refinement and improvement of computational models, and the development of new, innovative earth observing instruments and platforms.
Requested Funding Level: $221 million

International Science and Engineering
International collaboration is essential to the health of the nation's research enterprise. The importance of international partnership continues to increase as globalization "shrinks" our world. Consequently, our funding request for the Office of International Science and Engineering is increased by nearly 15 percent to $47.4 million. A major focus in our budget is the Partnerships for International Research and Education (PIRE) program, which increases by $3.0 million to $15.0 million. This program funds innovative, international collaborative research projects that link U.S. institutions and researchers at all career levels with premier international collaborators to work at the most promising frontiers of new knowledge.

Broadening Participation
NSF remains a leader in efforts to broaden participation in science and engineering, so that America's science and engineering enterprise is as diverse as the nation from which it draws its workforce. Our 2009 request for the Experimental Program to Stimulate Competitive Research (EPSCoR) program increases to $113.5 million. We are also increasing our request for several programs designed to reach out to underrepresented groups, including Alliances for Graduate Education and Professoriate (AGEP), the Historically Black Colleges and Universities-Undergraduate Program (HBCU-UP), the Louis Stokes Alliances for Minority Participation (LSAMP), and Centers of Research Excellence in Science and Technology (CREST).

Enhancing Opportunities for Beginning Researchers (CAREER)
The 2009 request provides an increase of approximately $14 million for funding of the CAREER program. This increase will allow us to award some 34 more CAREER awards than in FY 2008. CAREER awards support exceptionally promising college and university junior faculty who are committed to the integration of research and education. Our experience with previous CAREER awardees has proven that these faculty become the research leaders of their respective fields, and this program is vital to fostering the success of emerging science and technology leaders.
Requested Funding Level: $182 million

Stewardship
NSF's Stewardship goal, to support excellence in science and engineering research and education through a capable and responsive organization, remains a priority in the 2009 budget, with a 13 percent increase to $404.3 million. Our request increases the NSF workforce by 50 staff to enable us to manage our growing and increasingly complex workload. Investments in information technology (IT) increase by 32 percent to $82.0 million, with an emphasis on increasing the efficiency, productivity, and transparency of NSF's business processes. In this request, NSF's IT portfolio is realigned to tie funding for mission-related activities more directly to NSF's programs.
Requested Funding Level: $404 million

Major Research Equipment and Facilities Construction (MREFC) account
NSF will continue to support a portfolio of ongoing projects in the Major Research Equipment and Facilities Construction account (MREFC), including the Atacama Large Millimeter Array, Ice Cube, and Advanced LIGO.

The Foundation continues to be committed to the Alaska Regional Research Vessel (ARRV), the National Ecological Observatory Network (NEON), and the Ocean Observatories Initiative (OOI). However, in keeping with new NSF policies, Administration and Congressional mandates, and guidance from the National Science Board, NSF has adopted more stringent budget and schedule controls to improve our stewardship of taxpayer dollars. We are postponing requests for additional funding for those projects until they have undergone a final design review, completed a risk management plan, and developed a rigorous baseline budget, including carefully considered contingencies.

NSF's MREFC portfolio includes late-stage design-phase funding for the proposed Advanced Technology Solar Telescope (ATST), which if carried into the construction phase would be the first large U.S. solar telescope built in the past 30 years. ATST would reveal critical information needed to explore crucial mysteries such as: What are the mechanisms responsible for solar flares, coronal mass ejections and space weather, with their associated impact on satellites, communications networks, and power grids? What are the processes that cause solar variability and its impact on the Earth's climate and evolution? The ATST project is managed by the National Solar Observatory, which administers the world's leading collection of solar telescopes.
Requested Funding Level: $2.5 million

Concluding Remarks

Mr. Chairman, I've touched on just a handful of programs found in NSF's diverse and vibrant portfolio. NSF's research and education activities support the nation's innovation enterprise. America's present and future strength, prosperity and global preeminence depend directly on fundamental research. This is not merely rhetoric; the scientific and economic record of the past 30 years is proof that an investment in R&D is an investment in a secure future.

NSF may not be the largest agency that funds science and engineering research, but our size serves to keep us nimble. Our portfolio is continually evolving as we identify and pursue new research at the frontiers of knowledge. An essential part of our mission is to constantly re-think old categories and traditional perspectives. This ability is more important than ever, as conventional boundaries constantly shift and disappear – boundaries between nations, between disciplines, between science and engineering, and between what is basic and what is applied. NSF, with its mandate to support all fields of science and engineering, is uniquely positioned to meet the needs of researchers exploring human knowledge at these interfaces, whether we're organizing interdisciplinary conferences, enabling cyber-sharing of data and information, or encouraging new collaborations and partnerships across disciplinary and national borders. No other government agency comes close to our flexibility in STEM education and basic research.

In today's high-tech economy, the supply of new jobs is inextricably linked to the health of the nation's innovation endeavor. NSF is involved in all aspects of innovation; NSF not only funds the discoveries that directly become the innovations of tomorrow, we also fund discoveries that lead to still more discoveries that lead to the innovations of tomorrow, and, perhaps most critically, we train the technologists who dream up the discoveries that lead to the discoveries and innovations of tomorrow.

Industry increasingly relies on government support for high-risk, high-reward basic research. If we fail to provide adequate support of the technological sector now, we may well reduce our own economic security. It is no accident that our country's most productive and competitive industries are those that benefited the most from sustained federal investments in R&D – including computers and communications, semiconductors, biotechnology, and aerospace.

As we look to the century ahead of us, we face the reality that the other nations in this world are eager to create jobs and robust economies for their citizens. In this context, "globalization" is shorthand for a complex, permanent, and challenging environment that calls for sustainable, long-term responses, not just short-term fixes. Regardless of our action or inaction as a nation, the world is full of highly motivated and increasingly skilled workers who are working hard to improve their economic standing and well-being. We can either innovate, and keep our economic prosperity, or stagnate, and suffer the consequences of inaction.

Despite some of the more pessimistic forecasts of some observers, I believe that America can continue to be on the leading edge of ideas and research. Through strong federal leadership, we can maintain the standing of our businesses and universities. We must not only maintain our position, we must actively seek to increase our strengths: leadership in fundamental discovery, including high-risk, high-reward transformational research, state-of-the-art facilities and infrastructure, and a world-class S&E workforce. With a firm commitment to these fundamental building blocks of our high-tech economy, we can solidify America's role as the world leader in innovation.

Mr. Chairman and members of the Committee, I hope that this brief overview has given you a taste of just how very important the National Science Foundation and its activities are to the future prosperity of the United States. I look forward to working with you in months ahead, and I am happy to answer any questions you may have.

NATIONAL SCIENCE FOUNDATION AND NATIONAL SCIENCE BOARD RELATIONSHIP

Mr. MOLLOHAN. Thank you, Dr. Bement. I thank both of you for your testimony. You have an unusual relationship, unusual for a federal agency. The governing board has oversight responsibilities, program direction responsibilities, and the Foundation has implementation responsibilities. That balance between autonomy and working cooperatively must present such challenges.

The Committee would appreciate the benefit of your discussion of those challenges as they exist, and how you work them out, and how that relationship is today. I would like both of you to speak of that.

Dr. BEMENT. If I could lead off?

Mr. MOLLOHAN. Please.

Dr. BEMENT. Being a member of the Board and also being a former member of the Board, I feel that the relationship depends very much on leadership and also on the congenial relationship between the Director and the members of the Board.

We have very good leadership in Dr. Beering. And the relationship is better than I have known it for quite a long time. Obviously, there are issues that arise. Those need to be negotiated. And we do negotiate. They take continuing discussion with individual members of the Board. But I would say that those discussions are going quite well.

Mr. MOLLOHAN. Dr. Beering.

Dr. BEERING. Let me add that I have profound admiration and respect, not only for our Director and his deputy, but for all of the remarkable staff members that comprise the NSF group.

We meet regularly, not only in connection with the Board, but also before and after and on occasions like this. And there is complete agreement on our objectives and on how we can work together to further the objectives of the Foundation.

We are there to help the Foundation realize its goals and to serve the public in the best way we can. And I must say in my almost six years now, I have enjoyed this assignment very much. And look forward to continuing a very productive relationship.

Mr. MOLLOHAN. Are there any challenges before you today that pit the Board and the Foundation?

Dr. BEERING. I am unaware of that.

Mr. MOLLOHAN. How effective is oversight? Dr. Beering, do you feel like you are on top of oversight of the Foundation? Is the Foundation appreciative of that relationship?

Dr. BEERING. Well I think it is a collegial relationship. We are not an IG board. We work together as colleagues. And we understand each other's roles very well. We are really one common entity. And I have total confidence in what Dr. Bement and his associates are doing.

Dr. BEMENT. I would like to add that the Board serves as a very important and effective interface, as well as a communication channel with the community at large. They represent the community.

In some cases, they also provide the support for the Foundation in dealing with the community in setting budget priorities and in dealing with some of the hard policy decisions that we have to govern ourselves by.

So I think that the Board, and the structure that we have, is very positive.

U.S. LEADERSHIP IN SCIENTIFIC AND TECHNOLOGICAL INNOVATION

Mr. MOLLOHAN. The Committee appreciates the work of the Board in developing the report, "Science and Engineering Indicators of 2008."

It makes clear that we are at a critical time for the nation in science and engineering. The report shows that the U.S. remains the world leader in scientific and technological innovation.

But our leadership is being challenged in many areas. What trends most concern you, Dr. Beering?

Dr. BEERING. Well, I guess it is the beginning of the enterprise that most concerns me. And that is the subject of the STEM report. If we don't improve our STEM education enterprise, we are not going to have the manpower to compete effectively in the world of science globally.

And that keeps being documented in our indicators report. We have fallen behind many other countries. And we would like to see us regain the advantage that we enjoyed at one point. And I think we can. But it is going to take a concerted effort by all of us.

And there is no magic wand that we can wave. It is going to take a great deal of help by parents, by communities, by schools to get the underpinnings of our educational enterprise back in order.

And I am looking forward to an early implementation of our recommendations, in particular the Non-federal Coordinating Council that would assist the 95,000 school board members around the nation in their work.

NATIONAL ACTION PLAN FOR STEM EDUCATION

Mr. MOLLOHAN. You mentioned in your opening remarks a STEM action plan.

Dr. BEERING. Yes.

Mr. MOLLOHAN. Talk to us about that a bit please.

Dr. BEERING. Well the main thing is that we are recommending horizontal and vertical alignment of curricula efforts and a national non-federal coordinating council that would serve all of us.

And then secondly, another main recommendation——

Mr. MOLLOHAN. Excuse me, what does "horizontal" and "vertical" mean?

Dr. BEERING. This has to do with the flow of curricula opportunities for students. Right now when a student moves from one school district to another, he may miss the sequence of offerings that he would have had had he stayed in the same school district. And there just isn't any crosstalk among the school boards and school systems right now that would be desirable to make a smooth transition possible for the students.

And the other big thing is that teachers are not paid in keeping with the marketplace value that they have. A math teacher, for example, can be employed by industry at a much higher salary than this individual would get in the school system. And that is why we see a great many of them bailing out after two to five years and going into the private workforce and leaving the school system.

Mr. MOLLOHAN. Okay, thank you. We have a number of members here today. And we are going to proceed on a five-minute rule in first round. And ten minutes in the second round to assure that everybody gets an opportunity to ask questions. And we will see how many members remain after that. But sticking to the five-minute rule, Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Yes, thank you, Mr. Chairman. Dr. Beering, you are responding to the Chairman's questions relative to what is called the National Education Plan; isn't that right?

Dr. BEERING. Yes.

Mr. FRELINGHUYSEN. You know, you mention 95,000 school board members. I mean, it is a thankless job.

Dr. BEERING. Yes.

Mr. FRELINGHUYSEN. And I just wonder, how are you going to shake things up? Maybe that is not the politically correct way to say it. You have got obviously 50 states, each with a history of doing somewhat whatever they have always done.

There is always a question of how much an impact federal policy has. I mean, they are still arguing about the consequences of the No Child Left Behind Act.

How do you and others that you are working with plan to insert yourselves into a situation, which is sort of traditionally hidebound, stove-piped. All those things that may be appropriate to other parts of the government.

How are we going to get some success here? We can't sit around and argue philosophical things here. How are you going to insert yourself here?

Dr. BEERING. We are not proposing to have the National Science Foundation or Board manage individual school districts.

Mr. FRELINGHUYSEN. I wasn't suggesting that. I am just suggesting if we are going to vertical and horizontal.

Dr. BEERING. We are hoping that this National Coordinating Council will assist the individual school jurisdiction to structure a voluntary set of standards that everyone would subscribe to.

And to also have a better flow of curricula events so that there is some coordination across the state lines and also up and down the system.

Mr. FRELINGHUYSEN. So this is what you have somewhat charged Dr. Marburger with; is that right?

Dr. BEERING. Yes indeed.

Mr. FRELINGHUYSEN. And his response to my question on that yesterday was a little cloudy and unclear.

Dr. BEERING. Okay.

Mr. FRELINGHUYSEN. Where do you think the situation stands? I mean——

Dr. BEERING. Well, I think——

Mr. FRELINGHUYSEN [continuing]. You charged him and his office to create a standing committee within the National Science and Technology Council with the responsibility to coordinate all federal——

Dr. BEERING. Right.

Mr. FRELINGHUYSEN [continuing]. STEM education. How would you characterize where that might stand?

Dr. BEERING. Well I don't know how he feels about doing that. I hope that he is positively inclined, because so many federal initiatives right now that are not coordinated either. That was the intent of that particular committee to bring together the federal efforts. And to coordinate them.

And then the National Coordinating Council, non-federal, would assist the individual states and school jurisdictions to coordinate the rest of it around the nation. It is going to take——

Mr. FRELINGHUYSEN. Well, I am all for it.

Dr. BEERING. Okay.

Mr. FRELINGHUYSEN. Quite honestly, I have always felt that between our Department of Energy labs, our military installations, and the resource of the National Science Foundation, we ought to be turning the eyes and brains of a lot of fantastic federal employees and for those in university-based research, more towards K through 12. And I assume this is something, which is happening.

So maybe to Dr. Bement. His Board recommended create a roadmap for STEM education, K through 12 and then to college and beyond. Could you comment as to where you think we are?

Dr. BEMENT. Yes. I think we are doing quite well. Our Education and Human Resources Directorate has not only taken that charge seriously, but has spent a lot of time this past year developing partnerships with our research directorates in order to facilitate the implementation of the plan.

They identified five cross cutting themes, which will add impact and improve the outcomes of our education investments.

One of those themes is really to do institutional integration, the vertical part of what Dr. Beering called attention to. Namely being sure that at critical junctures in the education process, there is a seamless transition, so that expectations for performance match requirements for higher level education.

We call that our two plus two plus two approach. The first two is the last two years of secondary education, the junior and senior years in high school, including advanced placement and international baccalaureate programs. The second two are the first two years of undergraduate education, which brings in the community colleges as well. And then the third two-year period is the second two years of undergraduate education, which also includes matriculation of students from community colleges into four-year colleges and universities.

Being able to stimulate and to guide students through those critical decision periods is part of the vertical integration I am talking about.

Mr. FRELINGHUYSEN. Well, you certainly gave some of my people in New Jersey a pretty clear path. I appreciate that.

Dr. BEMENT. Thank you.

Mr. FRELINGHUYSEN. I hope we are doing as well around the rest around the country. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Thank you. Mr. Latham.

LEVEL OF INVESTMENT: U.S. VS. OTHER NATIONS

Mr. LATHAM. Thank you, Mr. Chairman, and welcome both of you. I'd like to step back in kind of a broader picture.

Where are we compared to the other advanced nations as far as our level of investment? Can you give us kind of an overview? A lot of people think we are falling way behind. Is that, in fact, the case? What do we need to do? And how do we rank?

Dr. BEMENT. Well, I will give you my impression. But Dr. Beering could talk more about the science and engineering indicator results.

I think in terms of high-tech manufacturing and development of innovative products, we are still a world leader in terms of percent of global market share of wealth generated by that type of industry.

On the other hand, we have to look ahead and look at the rate of change. And the rate of change is a little disturbing, not only because of the increasing rate of investment in China, where they vow that they are going to triple their investment over the next 20 years, but also because of their heavy investment in higher education, especially in graduate education, masters and PhD programs, which will greatly reduce the incentive of Chinese students to come to the United States and other countries for graduate education.

Projections indicate that China will close the gap with the United States over the next 20 years, in terms of not only innovation potential but also market share for high-tech products.

In order to address that challenge, we have got to keep our innovation system strong. But we even have to make it stronger. And so that is where my concern is.

CHINA'S INVESTMENT IN HIGHER EDUCATION

Mr. LATHAM. Give me a comparison. I mean, you state there is a heavy investment in higher education, and advanced training in China. What does that mean? I mean, compared to what? How do they range?

Dr. BEMENT. It is the founding of whole new universities and whole new graduate programs in China. A huge increase in investment.

I can get you numbers for the record. But I don't have them off hand.

[The information follows:]

STATE OF ADVANCED EDUCATION IN CHINA

Find below data extracted from official Chinese sources with (1) 1995-2004 data on higher education and (2) Chinese science and engineering (S&E) articles published in international peer-reviewed journals. The quality of the individual data elements is variable. Also, raw data is vulnerable to over-interpretation as demonstrated by a recent analysis carried out by researchers at Duke University (www.soc.duke.edu/resources/public_sociology/duke_outsourcing.pdf).

Key Findings

After increases during the 1990s, China's higher education sector expanded starting about 2000. From 2000 to 2004, the data shows these changes:

- institutions: up 66% to 1,731
- full-time teaching personnel: up 85% to 858,000
- funds for academic science & engineering activities: up 135% to 39 billion yuan (roughly US$5.5 billion).
- number of FTE R&D scientists & engineers (academia only): up 40% to 206,000
- higher education enrollment: up 140% to 13.3 million
- first level higher education degrees: up 152% to 2.4 million
- graduate degrees awarded (heavy concentration in science and engineering): up 156% to 151,000

Furthermore, Chinese authorities have begun to implement plans to slow somewhat the growth of undergraduate education, increase emphasis on advanced training, and improve the quality of higher education.

A separate report (China Science and Technology Indicators), issued by the Ministry of Science and Technology noted in 2004 that "...although the stock of the [human resources in science and technology] has caught up with that of the U.S., the size and quality of the HRST devoted to scientific and technological activities still lag far behind." (p. 35).

China has made progress in having its research publications accepted by international peer-reviewed journals - a 200% to 280% increase over a decade. This has moved China from 15th to 6th rank in worldwide publication counts. However, and illustrating the point made in the paragraph above, Chinese articles receive fewer citations than one would expect based on their number. In contrast, U.S. articles receive more citations than average, and citation rates for EU articles are near the worldwide average.

The main take-away point from the data is that China is engaged in an ongoing, strategic program to increase the size and improve the reputation of its higher education system and its science, engineering, and innovation system. Its past efforts have yielded sustained advances, and its continuing activities are expected to strongly impact the global S&T system.

China Higher Education Trends

	Higher education institutions	Employees (millions)	Full-time teachers	Scientists and Engineers
1995	1,054	1.04	401,000	307,985
1996	1,032	1.04	403,000	316,354

1997	1,020	1.03	405,000	311,622
1998	1,022	1.03	407,000	311,417
1999	1,071	1.07	426,000	328,991
2000	1,041	1.11	463,000	315,110
2001	1,225	1.21	532,000	358,844
2002	1,396	1.30	618,000	376,136
2003	1,552	1.45	725,000	403,785
2004	1,731	1.61	858,000	363,793

	FTE R&D scientists and engineers	Funds for academic S&T (billion yuan)	Higher education enrollment: total (millions)	Higher education graduates: first degree level (millions)	Higher education graduate-level enrollment (thousands)	Higher education graduate degrees (thousands)
1995	132,000	4.948	2.91	0.81	145	32
1996	132,000	5.654	3.02	0.84	163	40
1997	157,000	7.308	3.17	0.83	176	47
1998	161,000	8.496	3.41	0.83	199	47
1999	168,000	10.295	4.13	0.85	234	55
2000	147,000	16.678	5.56	0.95	301	59
2001	168,000	20.000	7.19	1.04	393	68
2002	178,000	24.770	9.03	1.34	501	81
2003	186,000	30.779	11.09	1.88	651	111
2004	206,000	39.163	13.34	2.39	820	151

Source: China Statistical Yearbook on Science and Technology, 2005, Table 4-1. China Statistical Yearbook 2005, Tables 21-6, 21-7, and 21-8.

China Publications Trends
Chinese S&T articles included in peer reviewed world literature

	ISI Thomson Science Citation Index (number)	Engineering Index (number)	ISI rank by publication volume	Engineering Index rank by publication volume	China: ISI Ratio of papers cited/total papers
1995	13,134	8,109	15	7	
1996					
1997	16,883	12,638	12	4	
1998	19,838	9,892	12	5	0.35
1999	24,476	14,807	10	3	0.38
2000	30,499	13,163	8	3	0.43
2001	36,585	18,578	8	3	0.45
2002	40,758	23,224	6	2	0.35
2003	49,788	24,997	6	3	0.39

Source: China Statistical Yearbook on Science and Technology, 2005, Tables 6-10, 6-11.

Mr. LATHAM. Okay, if you would. We hear about this all the time. I hear it. And I have Iowa State University in my district. We have difficulty getting top international students anymore to come in. A lot of them are going to stay in Europe or some are staying in Asia.

Dr. BEMENT. The cost of education is a big factor. We are a very expensive country when it comes to the cost of education for international students, especially coming——

INVESTMENT IN RESEARCH AND DEVELOPMENT: U.S. VS. CHINA

Mr. LATHAM. Do we know how much they are increasing, you know, percentagewise, their research—I mean, we have been reasonably steady.

Dr. BEMENT. Well if you look at the increase in research investment, at the present time China is investing at the rate of one percent of their gross domestic product in research and development.

Their intent is, by year 2020, to increase that to three percent of gross domestic——

Mr. LATHAM. Where is the U.S.?

Dr. BEMENT. At present, we are at about 2.6 to 2.7 percent of GDP. And about two thirds of that is private sector investment; one third is federal investment or public sector.

On the other hand, the public investment has been skewed very much more strongly toward development and away from basic and applied research. And so it tends to be much more short-term oriented than it had been in the past. And that is a concern, especially for the National Science Foundation.

Mr. LATHAM. Dr. Beering, do you have any comments or——

Dr. BEERING. Yeah. I might give you some numbers here. In terms of the U.S. versus China, our indicators show that China is rising rapidly, investing in capabilities associated with high-growth, high-technology industries.

They have captured a growing export share of high technology and manufacturing, reaching 20 percent share in 2005, while our share declined from 23 to 12 percent. Japan's share declined from 21 to 9 percent, and the European Union from 39 to 28 percent. And we don't know how India is doing. But we suspect they are ramping up as well.

So in a global context, we are reducing our efforts. And China is the remarkable tiger in the cage here. They are coming on strong.

IMPACT OF FY 2008 APPROPRIATION ON THE NUMBER OF GRANTS FUNDED

Mr. LATHAM. I know the fiscal year 2008 funding set you back. Can you give us any idea of how many fewer grants you were able to fund because of that?

Dr. BEMENT. Yes, I can. The lost opportunity we had in 2008 as a result of the Omnibus Appropriation was the loss of 1,000 grants. Those are 1,000 new ideas that will have to be put on hold.

In addition to that, since we educate graduate students through our research grants, that could represent as many as 1,500 graduate students that will not get support as research assistants.

It could also represent 300 to 350 young investigators, within five years of their last degree, that will not get funding support this year.

And I think that is a very big loss.

Mr. LATHAM. How many grants do you give? You are saying 1,000 less.

Dr. BEMENT. Last year, it was—I can give you the exact numbers. It was about 11,000 grants. Maybe I can. Here we are. Yes, last year we gave 11,500 awards based on 45,000 proposals. And we hope to increase that in the '09 budget by about 1,000 grants.

Mr. LATHAM. Okay, very good. Thank you, Mr. Chairman. I will have some more questions later.

URGENCY OF ADDRESSING STEM EDUCATION

Mr. MOLLOHAN. Mr. Honda.

Mr. HONDA. Thank you, Mr. Chairman. And Dr. Bement and Dr. Beering, thank you for being here today too.

October of last year, the Board released a National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, Engineering, and Mathematics Education System.

And I was really excited to be at the unveiling here on Capitol Hill. I support a number of your recommendations.

Currently I am developing legislation to coordinate the STEM education activities of the state, the federal agencies, institutions of higher education, and business through the Council for STEM Education and for the establishment of STEM education at the Department of Education.

And relative to that, my questions to both of you are what sense of urgency do you feel around making this a reality? And what might be the cost of waiting to provide the infrastructure to meet the challenges of what you have identified as a global economy?

Dr. BEERING. Well, I think it is urgent that we move ahead. But on the other hand, I would like to see us be deliberate. Do it right. So I am not going to set a time frame on it. I hope that everyone will agree that that is an issue that needs to be addressed at all levels. And that we ought to work together to achieve some of these proposals that have now surfaced as part of that STEM report.

Mr. HONDA. Well let me follow up on your comments. What you say is we should make haste with all deliberate speed.

Dr. BEERING. Deliberate speed, right.

Mr. HONDA. Starting when?

Dr. BEERING. Yesterday. As soon as possible.

Mr. HONDA. Okay. So it is an urgency that needs to be addressed now.

Dr. BEERING. Right.

Mr. HONDA. What you say is we should lay out the roadmap and those things—the components of it, check it off to see if there is concurrence. And then move on. And who would do that? Would that be the council that has been recommended to be put together? Do you have any idea?

Dr. BEERING. Well it would be multiple efforts. The council would be one. And the committee at Dr. Marburger's level would be another. The Department of Education, if they concur and appoint an organization within their department to address this issue, would be a third. The roadmap development that NSF is working on would be a fourth. And I think there need to be a great many collateral efforts that would all come together at the end.

But we all need to work at it.

Mr. HONDA. Dr. Bement.

Dr. BEMENT. Well you talked about partnerships. And partnerships are very important. We find in our Math and Science Partnership Program that bringing the private sector in, bringing community colleges into the picture, and also local and state governments are critically important in order to make progress.

And in that program, we have seen that getting whole communities together, including parents and businessmen, has really made a difference in sustained improvement, continuous improvement, in the education system, because everyone reads the scorecard, everyone keeps track of improvements, and everyone cares.

Now the issue is how do we do that at a larger scale? How do we do it at the stage of scaling up new initiatives, new interventions, new and best practices? And then how do we transfer that across the whole Nation? That is a higher order of partnership that we really need to work on. And that is where the state governments and the federal government have to be willing to come together on developing new standards, guidelines, and curricula improvements.

Mr. HONDA. So with respect to the action plan and developments of the council and the Office of STEM Education, were they not part of the thinking of the Board when they put the action plan together?

Dr. BEERING. That was part of it.

Mr. HONDA. Okay.

Dr. BEMENT. We directly participated in the report of the Board. I would like to add, and I think it is very important to bring this before the Committee, that we have very close working relationships with the Department of Education at every level.

And while we are doing the research and developing new best practices, we work closely with the Department of Education to link those to state efforts through their formula grant program in order to do just what I was talking about, in order to scale these efforts up, and also to transfer them broadly.

I think that type of a partnership has been effective. And it would certainly be prominently represented in our roadmap.

Mr. HONDA. If there was a vision that was put together to coordinate all these things together, and if you have a statute that allows you to do that, an enabling act, it would seem to me that there would be some initiative on someone's part there to create at least the first step in participation of that.

And if we look at our current curricula and the way it's established, it is pretty much disjointed, we don't coordinate our instruction of math, physics, chemistry.

And the way science is going now with their nanoscale, there is an obvious convergence of biological life science and natural science. If we don't start talking about that and preparing our teachers and our students to think like that, the industry's going to be continuously pulling people together, creating that team, and creating that mind set. It seems to me that this is something that we should be looking at.

Dr. BEMENT. Yes. I——

Mr. HONDA. I am concerned about the sense of urgency.

Dr. BEMENT. I fully agree with you. Right from the beginning of our nanotechnology initiative, we set aside funding to support education in the schools. And that is a very active program at the present time.

In almost all of our advanced technology programs, we pay a lot of attention to upgrading curriculum and inserting new knowledge, contemporary knowledge.

Mr. HONDA. Right.

Dr. BEMENT. That is critically important.

Mr. HONDA. Okay. And then in line——

Mr. MOLLOHAN. Mr. Honda, we will get you next round. Mr. Price, please.

Mr. PRICE. Thank you, Mr. Chairman. I want to welcome both of you to the Subcommittee. Dr. Bement, as time permits, I would like to take up two matters with you.

The first being the funding for the Advanced Technological Education Program, the only NSF program focused primarily on community colleges. And I would like to ask you to tell us what the implications are of the President's proposed flat funding for that program in terms of the number of meritorious applications you will be able to fund. I may have to do some of that for the record.

Dr. BEMENT. Yes.

SCIENCE AND ENGINEERING BEYOND MOORE'S LAW

Mr. PRICE. Because I first want to turn to your Moore's law initiative. The international technology roadmap for semiconductors produced by the SIA and the Semiconductor Research Corporation, located by the way in Research Triangle Park, North Carolina, projects that Moore's law will reach its limits around 2020.

Dr. BEMENT. That is correct.

Mr. PRICE. Now, my understanding is if we are going to be producing commercially-viable technology that goes beyond Moore's law by 2020, the key seminal papers conceptualizing that technology need to be published now or very soon. Others appear to be moving on the issue.

A press release last week announced that the European Union plans to invest 3 billion euros. That is about $4.5 billion over the next ten years in nano-electronics. So it would appear your inclusion of funding explicitly targeted at taking science and engineering beyond Moore's law is very well conceived.

With this situation in mind, including the competition we are facing, I wonder if that $20 million is a sufficient figure? It is not clear to me how that figure was arrived at. Nor is it clear how new this focus is. Is this $20 million new money newly focused on Moore's law? Or has a roughly equivalent amount been directed toward this problem in the past and this is more of an attempt at improved coordination?

Dr. BEMENT. Well let me answer the question two ways. First of all, we have a working relationship with the Semiconductor Research Corporation. We both put a million dollars to supplement ongoing grants in order to look at particular issues that are on their roadmap. And that has been a very good working relationship.

With regard to your second question, we see opportunities looking ahead to molecular electronics, which would bring in the biological sciences, looking at quantum dot devices and quantum electronics, which would bring in math and physical sciences as well as engineering.

So what we are trying to do is to integrate across the Foundation initiatives that have been supported in each of the directorates and offices in the Foundation. So this is just the beginning, the first year of a growing effort to do that interdisciplinary integration and to call for proposals that will offer transformative ideas on how best to get beyond current CMOS technology on silicon.

Mr. PRICE. That integration and improved coordination is worthwhile in and of itself. Do you have any estimate, though, of how much in the way of new investment or investment beyond past levels that $20 million represents?

Dr. BEMENT. I'm sorry. I didn't understand.

Mr. PRICE. How much of this is new money so to speak, or how much of it is just mainly pulling together existing projects and the funding streams?

Dr. BEMENT. It is part of the increased funding we are requesting in 2009. So it is over and above the funding that we have been investing in this area.

If you look at our overall initiative in communications or what we call the NITRD program, which is working in information technology research and development, it is well over a billion dollars all together. So this is the beginning of a new funding wedge that will deal with the cross integration through the Foundation.

ADVANCED TECHNOLOGY EDUCATION PROGRAM

Mr. PRICE. As I said, I commend you for that. I think it is an important initiative. And hope that we can support it fully.

As time permits, now let me turn to the ATE Program. I should acknowledge and commend both the Administration and the Committee for the increase in the current fiscal year that ATE has enjoyed, something like 11 percent, much needed.

However, we are back now to the old pattern of flat funding. And I wonder what you would say about that. And explicitly what you would say about the kind of proposals you are receiving that have merit. And how many of them you are able to fund. Do you have figures or can you furnish figures about the——

Dr. BEMENT. Well, I can——

Mr. PRICE [continuing]. Number of ATE proposals submitted for 2007, what percentage of those were funded, and how many you anticipate funding for 2008.

Dr. BEMENT. In fiscal year 2007, we received 185 proposals and made 53 awards for a funding rate of 29 percent. In 2009, we expect to make 70 new awards with the available funding. And the percentage of the budget that will be available for new awards will be 60 percent of the budget. Forty percent will be used to continue ongoing awards.

And I can get the numbers for 2008 if you would like.

Mr. PRICE. Well on the face of it I don't see how the funding we are talking about translates into that level of awards or that percentage of awards.

What would you say in general about the merit of the proposals you are receiving in these areas and what in the best of all worlds we would be funding?

Dr. BEMENT. Well this program enjoys a much higher funding rate than the Foundation in average. Our average funding rate is about 21 percent. So I would say that the awards that we are getting are very fundable.

In terms of award size, that is variable. The Center awards range from about $375,000 to $1.25 million per year. But we also give awards for individual projects——

Mr. PRICE. Yes.

Dr. BEMENT [continuing]. In addition to the Centers. And those range from $25,000 to $300,000 per year. So the total number of awards is a combination of those two categories.

Mr. PRICE. Well, I would appreciate it. I know my time has expired. I would appreciate you presenting, if you will, for the record in tabular form the full account of the awards granted versus the applications for these three years we are talking about. And any other information you think would be relevant to help us assess where we are going with this program and where we need to go.

Dr. BEMENT. Well we have that information. We would be pleased to provide it.

[The information follows:]

NATIONAL SCIENCE FOUNDATION
ADVANCED TECHNOLOGICAL EDUCATION (ATE) PROGRAM

During a six-year period (2000–2005), 320,000 students in associate degree programs, 48,000 secondary school students, and 6,000 baccalaureate degree students were enrolled in ATE-supported programs offered at more than 800 institutions in 49 states; and more than 80,000 educators (45% of whom were community college faculty, and 44% of whom were secondary school teachers) participated in ATE-supported professional development activities. The program also reaches a diverse population of students. According to the most recent survey of grantees, during 2006, 31% of ATE students were female and 36% were underrepresented minorities.

In FY 2009, in addition to making regular new Project and Center awards, NSF intends to make one large award and a few smaller ones for targeted research studies in technological education. This research is important to discovering not only *whether* particular strategies improve technological education, but *why* they do so and *which* students or faculty are most impacted. This research will be rigorously evaluated and will inform future directions of the ATE program as it continues to develop models that other organizations can use in their own programs supporting technological education.

In FY 2007, the ATE program had a funding rate of 29% for full proposals submitted for competitive review. The table below presents data on proposals and awards each of three years.

	Number of Proposals*	**Number of Awards***	**Funding (in millions)**	**Funding Rate***
FY 2007 (actual)	185	53	$50.58	29%
FY 2008 (in progress)	195	65	$51.62	33%
FY 2009 (projected)	220	65	$51.62	30%

Notes:

* Data for FY 2008 are estimates; proposals were reviewed on panels in late November 2007, and some award decisions have not been finalized yet. Data for FY 2009 are based on program officers' projections, and on planning that 60% of the requested budget will be available for new awards.

* This data reflects proposals submitted for competitive review at the ATE program's annual deadline, in response to the program solicitation. Every year, the program also funds a few (typically two or three) unsolicited proposals for workshops and other special projects, as well as a small number of requests for supplemental funding by active projects; and the program typically contributes funds to several awards which are managed by other programs but which impact technician education in a significant way.

Mr. PRICE. Thank you. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Thank you. Mr. Schiff.

Mr. SCHIFF. Thank you, Mr. Chairman. I just at the outset want to comment that the work being done at the Research Triangle is incredibly valuable and important. Although I think we all have to acknowledge that it pales in significance next to Advanced LIGO, which I think is done, oh, actually in my district.

Mr. PRICE. I am shocked, Mr. Schiff, that you would even broach the subject.

NSF FUNDING TRAJECTORY

Mr. SCHIFF. I want to ask you about a couple of things. And if there is time, get back to Advanced LIGO.

In terms of the overall budget for NSF, had you not been dinged by the Omnibus last year and gotten an increase last year that would have put you on track to double your funding, does the 13 percent increase this year make you whole in terms of where you would be on that trajectory? Or is it still short of that? If it is short of that, when you submitted the budget request or the proposal to OMB did you ask for more? That is my first question.

Why don't you go ahead, either one of you. And I have a follow-up question.

Dr. BEMENT. Well let me say that we are delighted, considering the amount of funding available for non-defense, discretionary spending, that the President has put us in a position where we can stay in the doubling track. So the 13 percent would keep us on that track.

Mr. SCHIFF. So if you had gotten the increase last year, you wouldn't be any further ahead if you get the full 13 percent this year?

Dr. BEMENT. Well if we had gotten the request last year, that would have been part of the 13 percent. So that would have made up about 7 percent of the 13 percent.

Mr. SCHIFF. Okay.

Dr. BEMENT. So this would be a continuation.

Mr. SCHIFF. And I realize that your grantees would be further along——

Dr. BEMENT. Yes.

Mr. SCHIFF [continuing]. If that happened. I am glad to see that the funding trajectory in the proposed budget has been restored.

Dr. BEMENT. Well, there were a large number of programs that had to be put on hold. And there were a number of other programs that had to be flat funded. And quite frankly, there are certain facilities where there may have to be reductions in force as a result of that.

POLITICIZATION OF SCIENCE

Mr. SCHIFF. Dr. Beering, let me ask you as an independent advisor to the Congress and the Administration, over the last several years there have been concerns raised in different fields within science and the Administration of politization of science. This was most notable in areas like global warming. From time to time large groups of scientists would write to raise this issue—that they considered that science was being put aside.

Is there anything going on now in any of the areas of science that our government is involved in? Do you think that the scientific conclusions are being either ignored, changed, altered, diminished for reasons that are separate and apart from good science?

Dr. BEERING. Well in general I would say no. But there are some indications, for example, off and on that stem cell research has major promise for the treatment of diabetes, particularly juvenile diabetes and Parkinson's disease to cite two. And there is more interest on the part of the private sector than on the part of the public sector to support that. That is more on the NIH side than it is on NSF. That is the only one I cite right now.

Mr. SCHIFF. I don't know if you have anything you would like to add on that question as well.

Dr. BEMENT. Well we do have a robust program in determining the rate of climate change. And, of course, that is different in different parts of the world. So we study it in the polar regions especially, because that is where the change is most dramatic.

We make all of our results publicly available. But we——

Mr. SCHIFF. Are either of you in a position where scientists who work within the Administration come to you and say, look, the work that I am doing and the conclusions that I am reaching are being misrepresented or are not being given the kind of public scrutiny that they deserve for reasons that I don't think are appropriate and are undercutting our work?

Are you the kind of positions that people would go to if they had those concerns? Have you heard those concerns?

Dr. BEMENT. As a matter of policy, we don't try to represent the research results of our grantees. We expect that they will present that type of information and full disclosure of their data in the open literature or other open formats on the Internet.

So we look to the community itself to develop their own conclusions. Now just to give you a snapshot of where I think the community is at the present time, there is absolutely no doubt that we are entering a period of global warming. I think that issue has a clear consensus.

There is also a clear consensus within the community that there is an anthropogenic forcing effect. That human beings are part of the problem.

Where there is a lack of consensus is the degree to which that forcing function is driving our current climate change. How much is cyclical and how much of it is due to anthropogenic effect.

And so there is a wide range of opinion. And it will take time, I believe, for the community, through further research, to narrow that range of variability on that issue.

So I think that is pretty much where things are at the present time.

Mr. SCHIFF. Am I out of time? Thank you.

Mr. MOLLOHAN. Thank you. Mr. Culberson.

Mr. CULBERSON. Thank you, Mr. Chairman. This is I think the most satisfying part of my job is being able to help this wonderful Subcommittee, where there are no partisan distinctions when it comes to investing in the sciences and in NASA and in protecting the future of this country by investing in basic R&D.

It is the one area I know that we can invest our dollars and know that it is truly going to improve the quality of life for our kids and our grandchildren.

And it is—I mean it sincerely, Mr. Chairman, Mr. Frelinghuysen, and all of you. It is just a joy to work with you, because we are all on the same page. And it is a lot of fun knowing that we have got these wonderful—this wonderful, friendly competition going between North Carolina and California. And Rice University, with nanotechnology research, the work being done at the Texas Medical Center, where they are using gold nanoshells where they appear to have essentially cured cancer in soft tissue cancers using these gold nanoshells. And work that is being done with single wall carbon nanotubes at Rice University to improve the semiconductor, making Moore's law.

Chairman Price, perhaps you are right. Absolutely using nanotechnology to make Moore's law obsolete is—it is just exciting stuff.

My hero, Thomas Jefferson, always said he liked the dreams of the future better than the memories of the past. And this is the one area where we can make the dreams of the future come true. So I am thrilled to be a part of this Subcommittee and to help with it.

And certainly to see the 13 percent increase. And Mr. Schiff's question is right on target. I am sorry you got dinged by the Omnibus but that the 13 percent gets you back on track.

And thinking about the strategic importance of the National Science Foundation to the future of the Nation. And the need to keep you on a path to doubling and sort of insulated process, reminds me of the—if you think about the Congress over the years has insulated the Federal Reserve Board from the pressures of politics by setting them out to serve as an independent agency.

The Congress has over the years protected the Government Accountability Office from the pressures of politics. And set them up as sort of an independent agency. The Congress has sort of insulated the Pentagon as essential to our strategic survival as immune from politics largely. And sort of set them and given them some special protections against the currents and winds of politics.

And I really hope—I would really love to work with the members of this Subcommittee and think of a way, for example, for the—following up on what Mr. Honda is talking about when it comes to strategic planning for education.

Why don't we think about long-term legislation? I would love to see the National Science Board for example be given the authority to give us a yearly budget. Just completely take science out of the President and the Executive Branch budgeting process. And let the National Science Board give the Appropriations Committee essentially a recommendation on what they think the funding level should be that is immune from politics and completely separate.

I think we owe that to our kids and grandkids. NASA frankly ought to be in the same boat. I just threw it out, because I think it is important we think outside the box.

We are facing challenges that this Nation has never really encountered before. And it is deeply disturbing. You are exactly right, Dr. Bement, to point out Norman Augustine's comment that unless we make substantial investments in basic scientific research, that the next generation of kids and our children and grandchildren may be the first in our Nation's history to see a lower standard of living.

And I couple that with the fact that the GAO—and I don't know if many of us have focused on this or seen it, because it is not—may be not widely known. But David Walker, the Comptroller of the United States, has calculated that the existing financial obligations of the United States are about $54 trillion. It works out to $175,000 a person. We would all have to write a check for $175,000 to pay off the existing obligations of Medicare, Medicaid, Social Security and the other federal government programs.

And the only way we are going to dig out of that hole is by not only strict fiscal discipline here, and not just on this Committee, but on Ways on Means, all the authorizing committees for the big social programs. But investing in science. I mean, you truly, throughout the Nation's history it has always been the investments in science that have made the—helped it—you know, increases in productivity, increases in scientific advancement.

We even have the possibility, Mr. Chairman and members, I—in talking to the scientists at the Texas Medical Center, not only have they—I don't have a question here, because I am totally committed to you guys. I just wanted to share this with the Committee. They have literally almost cured cancer.

They have literally been using gold nanoshells that they—two female chemists at Rice University have developed. They can create a batch of gold nanoshells that will stick to only a particular type of cancer. And they inject them in your body. They will after 72 hours shine an infrared light on your body that travels through your body like our body is as transparent as glass. And the gold nanoshells then heat up under the infrared light killing the cancer cell they are sticking to.

And without drugs, without surgery, without side effects, without chemotherapy, it kills every cancer cell in your body. And you are cured. And it works. Appears to be 100 percent effective. They are testing it now in head, neck, and throat cancers.

That research is also leading to the—and this is being done in California as well. I am not sure about North Carolina or elsewhere. But I hope it is, because we all need to work together on this. But they can also take this a step further. Just to throw this out to you all.

This is why this is so important what we do here and also at the National Institutes of Health, which by the way also needs to be pulled out of politics, because it is absurd that they have a flat funding this year. It is ridiculous.

But very quickly, just let me share this with you. They cannot only with gold nanoshells cure cancer, but now technology they are developing nanosponges that they can—when a child is in the womb, with the amniocentesis not only determine if the child has birth defects, but identify genetically based diseases such as—Lou Gehrig's disease or polio or diabetes, et cetera.

And this is literally being worked on right now in the Texas Medical Center using nanotechnology and research grants coming from the NIH and National Science Foundation. If the child is genetically predisposed to a particular disease, whip up a batch of nanosponges. And with a protein fix they can fix the genetic defect by reinjecting that back into the amniotic fluid. Which the child will then take up and cure the child's diseases before she is born.

Just extraordinary. And that is all there within our reach. But every year you guys have to go from pillar to post, and fight the bean counters at OMB, and make the case to them that you need this funding. I mean, it is just absurd.

And there are no party labels in this Committee. It is one of my—the whole Committee has been wonderful about it, but particularly this Subcommittee. And on Homeland Security, I mean, we are focused on the needs of the nation.

I just want to tell you how proud I am of the work you are doing. How I am of this Subcommittee and how devoted I am. As conservative as I am, this is the one area where the answer is always yes. And I am just very proud of you. And look forward to working with you Mr. Chair, Mr. Frelinghuysen, and the Subcommittee members to make the dreams of the future come true.

Dr. BEMENT. It only amplifies very elegantly the importance of one transformative idea. And that is where we are focused: at the frontier and supporting transformative research.

STEM EDUCATION RESEARCH

Ms. MELVIN. Thank you, John. Mr. Culberson states the sentiment of the Committee. And you have to look on that—just compelled to say right now is you have to look to the Committees mark as it came out of Committee to appreciate the—this Subcommittee's sentiment with regard to the National Science Foundation. And there is chagrin shared by every member of the Committee in the ding that you experienced in the Omnibus. We regret that. But we are glad to see your request put you back on track.

There is a lot of interesting STEM research in education. What we do, what we model, how we model it, how you scale it up. I would like to give both of you an opportunity just to kind of summarize your feelings about what we ought to be doing in order to meet the challenge that is presented by—every year report to the Committee that we are falling behind or we are not catching up with regard to producing enough scientists and engineers. And what we need to do in our educational system in order to solve that problem. And every year we talk about it. And this does not seem to be a solution.

But what are we doing? What is NSF's role? And is there adequate funding?

Dr. BEMENT. I would like to focus for a moment on a very important element of education, which really deals with the goals of the America COMPETES Act and also the American Competitiveness Initiative, to stimulate innovation in the country.

If you look at the growth of the STEM workforce, there are some problematic issues. The growth in the demand for stem scientists and engineers is growing at the rate of about five percent a year in high-tech industries especially.

However, the growth in degree production is only going up at the rate of 1½ percent a year.

Mr. MOLLOHAN. I'm sorry, the growth in what?

Dr. BEMENT. Degree production is about 1½ percent a year in science and engineering in STEM areas.

The serious factor on top of that is that we are beginning to retire significant numbers of baby boomers. And that retirement rate will also begin to increase over the next five to ten years.

So we are going to see very high level talent hollowed out from some of our laboratories, both defense and non-defense, and also from some of our industry laboratories.

So the budget request for 2009 addresses that. And I should say that we don't prioritize separately science from education, because they are integrated. Research and education are totally integrated along with broadening participation in the Foundation. So they are all equally important.

And as an illustration of that, we support the education and training of our graduate students through the research grants that we provide. And 95 percent of our total budget goes out the door in the form of grants.

Now in 2009, we will be able to support the education and training just through our research grants of 40,775 graduate students, which will be an increase from 2008 to 2009 of 5,000 graduate students.

Through our fellowships and traineeships, we will be able to provide fellowship and traineeship support to 5,450 graduate students.

Those are the students in the next three to four years, five years perhaps at the outset, that are going to provide a stimulus to keeping our innovation system strong, and help offset some of the losses that we are likely to see over the next five years due to retirements and other factors.

Mr. MOLLOHAN. Does this solve our problem?

Dr. BEMENT. It would certainly be a step in the right direction. It is pretty hard to know what would totally solve the problem. I don't think the numbers are adequate. But I think they are going to be helpful.

GRADUATE RESEARCH FELLOWSHIPS

Mr. MOLLOHAN. The graduate research fellowships you are talking about, is that what you are talking about——

Dr. BEMENT. Yes, the graduate research fellowships.

Mr. MOLLOHAN. A 32 percent increase in——

Dr. BEMENT. There is a 32 percent increase, which will increase the number of graduate research fellowships by 700, which is a significant increase. And it will make up for some of the losses in 2008 for that matter.

I should point out that in our graduate research fellowships, our flagship fellowship program, about 73 percent of those who get these fellowships go on and complete their PhD. And over the history of this fellowship program, we have supported the work of 29 Nobel Laureates.

Furthermore, Sergey Brin, who is the founder of Google, started his research with a graduate research fellowship at Stanford in ranking websites. And, of course, what we see is a return on that investment in a relatively short period of time, in ten years or less.

So these are the types of returns we are getting from this fellowship program. And it is also a way of providing talent directly to both universities and industry. As they graduate, they take with them their knowledge, their skills, their understanding of where the frontier is, what new ideas are viable, commercially viable, that can make a difference. And, of course, it is not just in industrial settings. It is also in medicine and many other settings as well.

Mr. MOLLOHAN. Well, that part of your answer focuses at the graduate level.

Dr. BEMENT. Yes.

PRE-K TO 12 EDUCATION

Mr. MOLLOHAN. Should we be doing something at the earlier?

Dr. BEMENT. Absolutely. It has to be along the entire pipeline. And it is for that reason that the Foundation starts even before kindergarten, pre-K all the way to postdocs.

Mr. MOLLOHAN. I know you do, but what should we be doing at pre-K and K through 12? And are we doing it? And is there adequate funding for it?

Dr. BEMENT. We should be, to start with, starting earlier in exposing young minds to hands-on activity related to science and engineering technology.

Mr. MOLLOHAN. Are you looking at how you do that?

Dr. BEMENT. Yes. It is a very important part of our program.

Mr. MOLLOHAN. And when do you——

Dr. BEMENT. It is not just in doing research on how early that can be effective, but what else should be taught in the earlier grades.

Mr. MOLLOHAN. Okay. Well——

Dr. BEMENT. But also how to prepare teachers to provide that type of education.

Mr. MOLLOHAN. Okay. Well, just focusing on that very early age, what are you doing, and I'm not saying you alone? What are we doing as a Nation? And I am very interested in the NSF's role. With regard to pre-K, the group you are talking about right now, what should we be doing? What are we doing? Is there adequate funding?

It is one thing to do it in the laboratory, but how do you communicate this to the educational community and implement it? And is it possible to implement it?

Dr. BEMENT. I think you are getting in an area where I should have Dr. Ward respond.

Mr. MOLLOHAN. Sure.

Dr. BEMENT. Dr. Ward is Deputy Assistant to the Director of our EHR Directorate.

Mr. MOLLOHAN. Because honestly every year we say this. We have this discussion. But the products maybe aren't developed. But they are not implemented. They don't become a part of the educational system. So——

Dr. WARD. May I speak loudly?

Mr. MOLLOHAN. Yes.

Dr. WARD. Okay. Thank you, Mr. Chairman.

Mr. MOLLOHAN. You certainly may. Yes.

MATH AND SCIENCE PARTNERSHIP PROGRAM

Dr. WARD. I would follow along what Director Bement mentioned earlier. Just one example is the Math and Science Partnership. And that is a program that focuses very heavily on teacher education, most particularly professional development of existing teachers.

But some aspects of pre-service also, trying to make the connection before students actually become teachers. We have evidence based on some of the tools that have been developed with the Math and Science Partnership, working in close collaboration with the Department of Education. That even early in this program, which began around 2000 or so, we are seeing significant improvement in student test scores, which is one indicator. Not the only indicator.

But in both science and math, at the elementary through the high school level, through the math and science program, they work very—in a very engaged fashion as Dr.——

Mr. MOLLOHAN. So you are employing this program on a trial basis in some areas——

Dr. WARD. Well MSP is——

Mr. MOLLOHAN. Is that——

Dr. WARD [continuing]. Nationwide. And it has almost 52 partnerships in existence now. And we have evidence of the effectiveness of this large teacher education program. And it results in the students——

Mr. MOLLOHAN. So it is still a trial. How would you characterize the effort? Is it a trial?

Dr. WARD. It is trial in the sense of the development of research and development of assessment tools of curriculum practices, of master/teacher strategies, and the like.

Mr. MOLLOHAN. What is it called?

Dr. WARD. Math and Science Partnership.

Mr. MOLLOHAN. Math and Science Partnership.

Dr. WARD. Yes.

Mr. MOLLOHAN. And when do you draw conclusions about the success of the program and make recommendations based upon that success?

Dr. WARD. That is part of the scale up and transfer——

Mr. MOLLOHAN. When does that happen?

Dr. WARD. After adequate assessment.

Mr. MOLLOHAN. Well, I mean, I was looking for kind of a period, a time. Two thousand ten or two thousand nine.

Dr. WARD. Well recently some of the evidence that we have as recently as 2006 is convincing enough. It is early data. But it is convincing enough that it is being adopted by some of the state education MSPs. Policies are being implemented statewide in places like Georgia. Other locations as well on the basis of convincing evidence that is resulting from assessments underway by some of the best experts in the field.

And, again, this is from elementary through high school. It is encouraging. It is still early. But it is encouraging. It is impressive enough to be picked up by the state level.

Mr. MOLLOHAN. Do you anticipate it being—I don't know how you would characterize it, but a product that can be taken by a school system at different grade levels and implemented in their system and——

Dr. WARD. We have many examples of that.

Mr. MOLLOHAN. Yeah. Well, that's exciting.

Dr. WARD. We are working with the University of Michigan. Statewide work in Georgia now adopted from those kinds of assessments.

Mr. MOLLOHAN. And it is still ongoing. I would be interested in following up.

Mr. FRELINGHUYSEN. Would the Chair yield?

Mr. MOLLOHAN. Since he is finished, I will yield to you.

Mr. FRELINGHUYSEN. You might just remain standing for a minute if you don't mind. Thank you.

On the Math and Science Partnerships, I want to get a little more specific. Most of the money goes to the U.S. Department of Education, is that right, about $179 million. The National Science Foundation portion is $51 million. Is that flat, or has there been a reduction? And if there has been a reduction, was there some sort of method to that?

Dr. WARD. A few years ago there was a very steep reduction to the NSF investment in the Math and Science Partnership. We are very encouraged that we are seeing a reversal of that. Even last year, there was a significant reinfusion of funds back into the Math and Science Partnership. And even now there is about—I believe about a five percent, five and a half percent, growth rate. And as was mentioned earlier, as existing awards come to completion, we can fund up to 15 to 20 new Math and Science Partnerships over several categories of this program.

So we are pleased about that. We are pleased about the impact that we can make, not only in the return of our budget.

Mr. FRELINGHUYSEN. Okay.

Dr. WARD. But, again, in terms of being able to transfer and disseminate the findings of these tools at the research throughout all of the Math and Science Partnership.

Mr. FRELINGHUYSEN. Thank you for the good work you are doing.

Dr. BEMENT. I can augment that just a moment. And Dr. Ward hopefully will correct me if my numbers wrong. But I think at the present time we have Math and Science Partnerships in about 30 states; is that correct?

Dr. WARD. That is correct.

Dr. BEMENT. And about two thirds of the states are participating in implementation of some of the methods that are developed out of our Math and Science Partnership. And that is through full participation of the Department of Education, which has responsibility for scaling these programs up.

So I see our respective roles of the National Science Foundation doing the research and development to determine what works and can be shown to work through effective evaluation and the Department of Education working with the states and with the National Science Foundation to make what works work more broadly in our education systems.

Now at present, we only touch about 5 percent of all the school districts in the country. There are roughly 15,000 to 16,000 school districts. So it is a daunting task to carry on that transformation throughout the country. But that is what we have to do. That is the challenge that we have. And that is where the——

Mr. FRELINGHUYSEN. I don't mean to be solicitous. You have huge credibility.

Dr. BEMENT. We have a large footprint.

Mr. FRELINGHUYSEN. Yes, you do. And not to say that the Department of Education doesn't. But when your stamp of approval goes on there, a lot of thought, and time, and effort goes into it. I commend you for your involvement. And at every opportunity, we need to promote.

Dr. BEMENT. And I see the good work of the Board in developing their action plan is addressing that issue.

INTERNATIONAL POLAR YEAR

Mr. FRELINGHUYSEN. I wasn't leaving the Board out. But I appreciate their support.

Dr. Bement, I want to shift somewhat dramatically, but not because of the absence of the Chairman. Your involvement as the lead agency for the International Polar Year——

Dr. BEMENT. Yes.

Mr. FRELINGHUYSEN. I sort of wear my heart on my sleeve. I would like you to talk about your leadership in that arena. Where are we working with our international partners? And why these polar missions, and particularly our work at the South Pole, is so important in the overall scheme of things, relative to scientific exploration, pushing that envelope in those unique harsh regions.

Dr. BEMENT. Well I think our leadership has existed on several fronts. One is we were the lead agency for the interagency program of the U.S. and our being involved in the International Polar Year.

But we have also worked with international organizations as well, ICSU and some of the other international organizations that started this whole initiative, the International Polar Year.

But also we have taken a multi-national approach and both in the Arctic and the Antarctic we have multi-national initiatives. Not only to study climate change, but also ice sheet stability and other global issues that are before us.

For example, in the Antarctic, you saw the Andrill Coring Operation. That was an international partnership. Some of the coring that is going throughout the ice sheet in the Antarctic involves cooperation with several nations.

In the Arctic, we are working with a number of nations now to set up an Arctic Observing Network.

So it is not just what is occurring in the International Polar Year, which will end this year. It is the legacy that we will leave behind that will be ongoing activities involving international participation.

But also in capturing all the data that is coming out of this two-year effort and mining it in the future to get a better understanding.

Mr. FRELINGHUYSEN. It has been a while since we have had an International Polar Year.

Dr. BEMENT. That is right. They come every 50 years.

Mr. FRELINGHUYSEN. Yes. It has been a while. The effort is something which I quite honestly was not totally aware of.

Dr. BEMENT. Well we are putting infrastructure in place that didn't exist before the International Polar Year. And that new infrastructure will support science going forward over the next——

Mr. FRELINGHUYSEN. Your Office of Polar Programs has an 11 percent increase. And I assume you are going to put that to good purposes.

Dr. BEMENT. Absolutely.

Mr. FRELINGHUYSEN. I just had a comment. As I said earlier, I was impressed by the dedication and relative youth of those that are involved with the research on behalf of the National Science Foundation and other federal agencies.

And the university connections, and obviously people are very proud of their own university-based research, and I think we had a brief discussion. I think that the National Science Foundation ought to be somewhat—I won't say selfishly more identified with some of those projects, because were it not for your—you know, the reviews that you make in a very—some of those university-based projects would perhaps never see the light of day.

I do hope and I know that each of these sites that I visited has a Web site. And in reality we need to put a human face, even though it may be difficult for me to explain exactly what—although I did see certain things in the sediment. To think that you could actually transmit that scientist, that man or woman, the work that they are doing, right into an American classroom, that speaks of why we—why we are doing so much in terms of STEM education.

I just wondered if you would speak to that issue briefly.

Dr. BEMENT. I am glad that you brought that up, because it is a very important part or our International Polar Year. Apart from the publications that each of the individual scientists put into the public domain, we have, as part of our leadership, established an IPY Web site that brings together all the work of all the agencies that have been involved in this program, and makes that information available to the public.

In addition to that, through our public outreach activities, and our Office of Public and Legislative Affairs, we have any number of initiatives, more than I could recite briefly, but we can submit this for the record, where we are informing the public not only through museums but by other means. And I would like to have the opportunity to provide that information.

[The information follows:]

NATIONAL SCIENCE FOUNDATION PUBLIC OUTREACH ACTIVITIES

The National Science Foundation's Office of Legislative and Public Affairs has formed a variety of partnerships to communicate science broadly through print, broadcast and multimedia outlets, including the Internet, newspapers, magazines, public forums, television, and radio. Below are a few examples.

NATIONAL MEDIA PARTNERSHIPS

NSF has partnered with the ResearchChannel to provide 150 hours of programming a year. The programming includes a series of scientific lectures, panel discussions, and new and archived video from research and educational communities. ResearchChannel is available in more than 26 million U.S. households. Another recent partnership is with U.S. News & World Report. NSF provides weekly content for the newsmagazine's science section on http://www.usnews.com/sections/science/index.html. In addition, NSF works with universities and colleges around the Nation to publish weekly articles and daily images or video to Live Science (http://

www.livescience.com/index2.html), an online community news resource that attracts more than 4 million visitors each month.

NEW ONLINE TOOLS

NSF is collaborating with the AAAS Center for Public Engagement with Science and Technology to offer online communication webinars, how-to tips for media interviews, strategies for identifying public outreach opportunities, and more via "Communicating Science: Tools for Scientists and Engineers" (http://communicatingscience.aaas.org/Pages/newmain.aspx). And, in order to better illustrate the outcomes of NSF-funded research, NSF is developing a Science and Innovation Web site that highlights research by state, region, and Congressional district. This site is under development and will be launched in fall 2008.

COLLABORATIVE EFFORTS

NSF's public affairs office has established two-day workshops with public information officers at American colleges, universities, and research institutions to foster stronger collaborative communications efforts. A related Web site—the Public Information Officer Resource Center—offers a forum to share ideas and learn more about how NSF can help reach diverse audiences: http://www.nsf.gov/news/nsfpio//.

POLAR ICEBREAKING

Mr. FRELINGHUYSEN. Well thank you. And lastly, we had some discussion with Dr. Marburger. I am not sure we caught him off guard on the fact that our Antarctic stations are dependent on ice breaking capability. I am not sure he was prepared for that question.

Could you sort of talk about that issue just for the record? Obviously, we have been able to count on a far and assist. But the Committee had some interest yesterday. Maybe that was reported to you, where we should be making investments. And we certainly don't want to do it at the expense of your budget.

Dr. BEMENT. Our primary interest is, of course, to support science in these extreme environments. So the ice breaking we support. It is primarily for that mission only. Recognizing that there are other missions for ice breakers.

With regard to that responsibility, we are also required under executive directive that we do it in a most cost effective way. And we have benefitted from the availability of the Oden to break through the ice to McMurdo. Primarily because they bring their own fuel, they are not dependent on McMurdo. They have berthing space and laboratory space to support scientists. So it is really a research vessel as well. And that is an added benefit.

But getting beyond ice breakers per se, we are also trying to invest in our infrastructure to use renewable energy, instead of using fuel to reduce the fuel loading. But also to find alternate ways to transport fuel from McMurdo to the South Pole. And improve our storage capacity, so it may not in the future be necessary that we break through the ice each and every year. We will have enough storage capability to perhaps skip a year from time to time.

Those are the economies that we constantly look at with regard to logistics support.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Mr. Honda.

Mr. HONDA. Thank you. If I could direct the question to the Assistant Secretary.

Mr. MOLLOHAN. Deputy.

PRE-K TO 12 PROGRAMMING

Mr. HONDA. I am sorry, I didn't know your name. But just to pick up the conversation on what the Chair had asked about. The question really was towards pre-kindergarten I believe. And you were addressing kindergarten and on.

What are the kind of activities that are being geared towards pre-K and those from K–12 on? My sense of what is going on in the field is that what you are describing is not really out there as of yet. You said there are 20 states, two third of the 30, which is 20 states, that are actively involved. Do you have a written report on this kind of activity?

Dr. WARD. I certainly can provide that. We can provide ample detail to that.

Mr. HONDA. By when?

Dr. WARD. But thank you also for the follow up. In addition to that program, and I will—you are correct. The emphasis is on elementary through high school. There is some involvement through significant outreach through parental involvement and the like, even at the pre-K before they actually get to kindergarten.

But another very important avenue for us at NSF is through our Informal Science Education program. We can provide that information to you as well. There is significant outreach through exhibits, through the media, Bill Nye the Science Guy, through our teacher proposals.

[The information follows:]

NATIONAL SCIENCE FOUNDATION
PRE-KINDERGARTEN AND EARLY CHILDHOOD EDUCATION INVESTMENTS

The portfolio of investments in pre-kindergarten (preK) and early childhood education is an important component of the overall Directorate for Education and Human Resources (EHR) portfolio, with projects funded in all program areas of the directorate that include a focus on school readiness. These include the Math and Science Partnership (MSP), Informal Science Education (ISE), Innovative Technology Experiences for Students and Teachers (ITEST), Discovery Research K-12 (DR-K12), and Research and Evaluation on Education in Science and Engineering (REESE), as well as their predecessor programs.

The overall EHR portfolio includes a framework for a purposeful array of design, implementation, and research efforts intended to further STEM learning for young children, as well as for their parents and supporting communities. In each year of the MSP program, for example, about 30% of all funded Comprehensive and Targeted Partnerships report engagement with preK education. The ISE program has funded television productions and exhibits that target STEM learning for preschool and young children and their parents. A number of curriculum projects in the DRK-12 portfolio have focused on enabling preschool and young children to engage with mathematics and science. Some have been included in teacher professional development initiatives, and several have been developed in partnership with Head Start programs. Research projects funded in REESE examine how young children learn science and mathematics, where an interesting trend in the findings is that, given appropriate instructional materials and teaching, young children can learn more complex and varied science and mathematics concepts and processes than have traditionally been believed.

The following illustrate investment in preschool and early childhood education and outreach:

- In the New Jersey Math and Science Partnership (NJ MSP), a collaboration of two universities (Rutgers University and Rowan University) and 11 local school districts throughout the state, early childhood teacher professional development has been an area of focus. This professional development included a series devoted to the development of preK learning communities. Preliminary results suggest that participating preK-classroom teachers' and master teachers' understanding of science learning improve in (a) identifying the important elements of science and (b) the factors to consider in determining the science content to address with young children. Project findings further suggest that increased emphasis on the use of inquiry is perhaps the most important element in teaching science to young children, as inquiry engages students in learning processes through questioning, discovery, curiosity, exploring, and reflecting. Professional development participants also reported the utility of their professional development in helping them to use playtime as an opportunity for learning science.

- FOCUS, an MSP project led by the University of California-Irvine, participates in a broad preK-12 partnership that includes preK-K Science, Mathematics and Reading Training Schools (SMARTS) with a goal to develop pre-K Teacher Leaders who model effective, research-supported practices for colleagues and parents. In SMARTS Leadership Institutes, preK-K educators were introduced to research-based assessment and instructional practices that integrate science, mathematics, and literacy aimed at improving learning for young children and English Learners at home and in classroom settings. The project has produced SMILE (**S**cience and **M**ath **I**ntegrating **L**iteracy in **E**arly Childhood) videos that are being broadly disseminated.

- "PEEP and the Big Wide World," developed by WGBH, is an animated series that incorporates the innovations of teaching science to preschoolers. This award-winning television series is broadcast on The Learning Channel and Discovery Kids. The Children's Museum of Boston is further extending the reach of PEEP through exhibits in museums and is involved in partnership with Action for Boston Community Head Start programs.

- The Museum of Science (Boston) Discovery Center is collaborating with the MIT Early Childhood Cognition Lab and other museums to develop and evaluate a variety of methods for engaging adults with young children in activities that apply current cognitive science research to children's exploratory play and causal reasoning development.

- At the University of Northern Iowa, faculty are creating an age-appropriate physical science curriculum for children, ages 3 to 8, to develop practical understanding of the movement of objects as a foundation for learning about the concepts of forces and motion.

- Through "The Building Blocks" project, researchers and developers at the University at Buffalo have developed curricular materials for pre-K through grade 2 to enable young children to build many of the foundations needed for solid mathematics content knowledge and higher-order thinking skills. These research-based materials focus on spatial and geometric concepts, as well as numeric and quantitative concepts. In another project, a group at the University is conducting a large study of a preK mathematics curriculum that is based on knowledge of human development and that uses technologies appropriate for these levels. The curriculum is being implemented with Head Start and State-funded pre-K programs and is being studied and evaluated using an appropriate, randomized clinical trial methodology.

- At the Preschool Pathways to Science (PrePS) program at Rutgers University, children gain experience with observing, predicting, and checking; comparing, contrasting, and experimenting; and documenting findings in charts, graphs, and science journals. These science practices are encouraged in the context of science content that children wonder about and that is relevant to their everyday lives. To illustrate, one set of classroom experiences centered on growth experiments with plants. Children described what they thought plants needed to grow – water, sun, soil, and love – and then planted seeds under various conditions to test the importance of some of these factors. Their findings were recorded in children's science journals, a learning activity that encouraged attention to detail and literacy development. Using pre- and -post measures with controlled and intervention groups, the project's research team found that preschoolers who participate in extended explorations show increased science reasoning. Along with supporting children's understanding of basic aspects of the experimental method, preliminary results suggest that participation in the PrePS science program supports growth of descriptive vocabulary and more appropriate use of science tools such as balance scales and journals.

- The Vermont Center for the Book supports work that infuses STEM content and concepts into librarians' practices to establish the public library as a STEM learning center for young children and their families.

- Through their examination of the forms of scientific inquiry within the intellectual reach of K-3 children, researchers at the University of California-Berkeley have shown that young children can productively engage in hypothetical-deductive thought.

Mr. HONDA. Okay. So that you will have that in writing. And the mechanism by which you extend this information.

Dr. WARD. Absolutely.

STEM POLICY NATIONWIDE

Mr. HONDA. But this is not in a formal manner. It is what you are doing as a matter of course at this point in time.

The issue about the council and the office of STEM education, the office of education, as a person from that department, is there a need for this focus in order for us to be able to move forward and accomplish what we are asking about the coordination of the different disciplines? And the disciplines are only in the science areas. It is not in ethics or any other humanities, which I think it should be part of the full educational process. So that we have citizens who understand, who are exposed to science as well as the humanities.

But the Office of Education and establishing the Office of STEM Education, is that something that you see as necessary to accomplish the goals that have been laid out? I know it is a loaded question.

Dr. BEMENT. That is a question for the Administration. I can't really speak for the Administration on that issue.

Mr. HONDA. Well, we are putting together a bill. And that was part of your action plan. It was part of your recommendation.

Dr. BEMENT. Yes. But the report put out by the Board was not just for the NSF. It was for the federal government at large. So it was policy advice to the Administration for the most part.

In other words, it is a report for the nation more than anything else. Would you——

Dr. BEERING. I think the problems that we are confronting today as a world, which is a small world, a flat world, we can communicate instantly around the globe, are really issues of humanity and society that affect everybody. And it is not just while the manifestations may be local, it isn't just an American problem or a Japanese or Chinese problem. It is a global problem.

And so I look forward to presenting to you the ideas that come from our international task force, which we will get to you in a matter of weeks.

And the key word there is partnerships around the globe. And we would like to foster an environment where we work together on commonly recognized issues that affect all of us.

And I guess what is the biggest challenge is going back to Plato and Aristotle and Socrates is how can we frame the best questions to address all of these issues that would be understood and subscribed to by the people around the world?

We need to take the lead in that, because we have the resources, we have the background. We have the fundamental ability to make a huge difference for everybody. And I look forward to that.

Mr. HONDA. Through the Chair again. Intellectually I understand what you said. Practically in terms of taking action, we know what we have to do. You laid it out there as recommendations of a plan of action.

You know, to be partners and full partners, we have to be prepared to do that. And part of that preparation it seems like we are not preparing our systems to do that. We know what we have to do. We know how to extend Moore's law to 2010–2020. The nano initiative says that. We can accomplish income that exceeds a trillion dollars. And also extend Moore's law. I think it is up to 50 years in this arena.

The more I know these factors, it seems to me somehow there should be a sense of urgency to have our departments work together, come out with a plan, and lay it out in front of us so that we can say "yea" or "nay" and fund it appropriately, teacher education, student preparation, and parent participation.

Maybe I am missing something.

Dr. BEERING. I think you are right on. And I love the attitude that you have all displayed here. And I would like to take up Mr. Culberson's charge to be nonpolitical and nonpartisan. And not be constrained by arbitrary budget restrictions. It would be exciting.

GRADUATE RESEARCH FELLOWSHIPS

Mr. MOLLOHAN. Thank you. And Dr. Bement, when I left we were talking about education funding. And I wanted to give you an opportunity to speak to the graduate resource fellows program. We understand how important they are and how important they are to you.

Your request in 2009 is for $117 million. That is—if this is accurate, this is a 32 percent increase. But it is actually a request above the authorization. So do you know you are asking for a request above the authorization?

I mean, it is fine that you do that. But I want to give you an opportunity to——

Dr. BEMENT. I wasn't aware of that.

Mr. MOLLOHAN. Yes. I just want to give you an opportunity to talk about how important that program is to you, because that is a big increase you are asking.

Dr. BEMENT. I think it is the most important investment we can make in our graduate education program and in our fellowship program.

I think I expressed myself a little bit earlier about the impact of that program, potential impact, and why we consider it so important.

The more top talent that we can put out into our innovation system in the short term, in the next four or five years, the better. I believe this is one of the best investments we can make. And I would give that very high priority.

EPSCOR FUNDING

Mr. MOLLOHAN. Okay. Thank you. You in your op plan, and we just received it last night, I had a chance to see it. I knew you were the high-tech agency. When it came across, we couldn't open it last night. Maybe it was our fault.

Your justification would suggest that you are going to recommend funding EPSCoR at $111 million.

Dr. BEMENT. Yes.

Mr. MOLLOHAN. We included $115 million in the conference agreement. So you have nicked that. And then your 2009 request is $114 million.

Dr. BEMENT. Yes.

Mr. MOLLOHAN. So how do you—what is your reason?

Dr. BEMENT. Well, first of all, we consider the EPSCoR a major program as far as the American Competitiveness Initiative. We can't meet the Nation's goals to be internationally competitive without full participation of the EPSCoR states.

In structuring the budget, however, we pay attention to the number of commitments we have in terms of continuing grants, renewal grants, and also new proposals for all of the 27 states that are part of the initiative and the two districts.

And as we look at the 2009 budget year, we feel that we put enough funding in for all the expected RII grants and also the track 2 grants. So we feel we not only are prepared to meet those commitments, but we might even have a little extra money left over, which is often the case. And it means carrying over funding from year to year. And, of course, that funding got rescinded as part of the Omnibus Bill.

The problem we have is lack of flexibility, because there is a partition of what we can put into the RII program and what we can put into the co-pay program. And I consider that unfortunate, because we have now increased the leveraging of the co-pay program over time. It used to be a dollar for dollar. Now it is two dollars for a dollar. So we get much more bang for the buck in order to leverage the funding in the EPSCoR account by funding provided by the other directorates.

And it would be very helpful to us if we had the flexibility of taking money that we may not use for the RII grants and put that into co-pay in order to use all the funding effectively.

So the short answer to your question is I think I believe we have put enough money in the 2009 budget to meet all of our requirements.

EPSCOR PROGRESS

Mr. MOLLOHAN. Okay. How are the states doing in the EPSCoR program? How do you measure how they are doing?

Dr. BEMENT. Well one way we intend to measure it— first of all, I brought the program up to the office of the Director in order to try and make it more strategic and to put more of a planning component into the program. That has been embraced by each of the EPSCoR states.

And they are now developing strategic plans, which not only deal with how they are going to invest the resources, but also how they are going to graduate over time. So it is a much more proactive stance than we have had in the program for some years. We haven't seen those plans yet, but they will be forthcoming with new proposals.

At the present time, looking at the states that are in the EPSCoR program, there is only one state that is close to graduating under the current criteria for graduation. And that state is just a little bit below the mark, which is .75 percent of the NSF budget. They are .7477 percent, which is getting awfully close, even out to the third decimal point.

But that generally has to be sustained and demonstrated over a three-year period. Going beyond that one state, the numbers trail off very rapidly. So many of the states are not going to be ready to graduate for many years to come.

Through our outreach activity, we hope we can continue to improve the effectiveness of the program, but also improve the competitiveness of these states for getting grants in our base program through all of our directorates. And, of course, that will be the measure of success; how successful they are going to be in order to get normal grants and compete with other scientists throughout the community.

Mr. MOLLOHAN. Okay. Thank you. Mr. Frelinghuysen. Oh, Mr. Latham.

PLANT GENOME RESEARCH PROGRAM

Mr. LATHAM. Thank you, Mr. Chairman. As I understand in your budget proposals, you proposed to move the National Plant Genome Research Program from one program to another.

And there is great concern that this will effectively reduce the funding for that type of research by about 25 percent. Clearly, that would have a very negative impact as far as plant biology, as far as current/future crops.

I just wondered if you could give me any assurance that type of reduction will not occur. The Chairman may remember we had a great witness at the end of last year that spoke about the importance of this project. If you could give me any kind of information.

Dr. BEMENT. I can assure you that that program will not be reduced. It is one of our most important programs. In fact, it is more important now than it has been. We are making good progress in completing the understanding of Arabidopsis as a standard.

We are now into a ten-year program to understand the expression of all the genes in the genome. That is critically important as a reference.

We have a very active program in completing genomes for rice, maize, and other crops of economic importance. And now we are on the threshold of dealing with biomass for energy conversion.

And so the science that we are doing on plants is also dealing with the recalcitrance of extracting sugars from these plants and also advanced processing. And perhaps even eventually getting to green gasoline, converting biomass directly to gasoline. That is quite possible.

BIOFUEL RESEARCH

Mr. LATHAM. Yeah. Well and that is exactly my next question, talking about "green gasoline." Could you maybe elaborate on that? And what other types of research projects are you funding in that biofuels, and you know, green gasoline area? And what impact?

Dr. BEMENT. I can give you three or four examples. But I welcome being able to present a more complete——

Mr. LATHAM. Right.

Dr. BEMENT [continuing]. Listing for the record. Investigators at the University of Wisconsin, in collaboration with the Danish Technical University and the Max Planck Institute in Munich, have explored the use of using inorganic catalysts to take the sugars that come out of the early extraction process, converting them directly to what is called furfurals, which is a precursor to gasoline.

Now that process has been brought to a demonstration stage. In fact, it is a truck-mounted demonstration we want to bring to the Hill one of these days to show you how this works. But we still have to get through that first stage of extracting the sugars from the biomass.

Part of the research really has to do with how can you, by bioengineering, design plants that are more amendable to processing so that recalcitrance can be overcome? Some of this work is being done jointly with the Department of Energy as well.

We have another program that deals with the biocatalysts, which are poisoned by the alcohol. And so there is a dilution factor. It has to be sufficiently dilute, so you don't destroy the biocatalyst.

Researchers at MIT are using genetic engineering to actually come up with biocatalysts that are much more resistant to alcohol poison. And we will be able to work with much more concentrated liquids, and get much higher yields.

Finally, the third example would be work at UCLA, I believe, in looking at production of isobutanol, which is a much more effective fuel, insomuch as it has the same energy content as gasoline. It has a much lower vapor pressure than ethanol. And you don't have to take range penalty as far as mileage in the blending of gasoline with alcohol.

And there are many other advantages that have to do with compatibility in storage containers and so forth, because it doesn't take up water as ethanol does.

So those are just a few examples.

[The information follows:]

BIOFUEL/GREEN GASOLINE RESEARCH FUNDED BY THE NATIONAL SCIENCE FOUNDATION

The descriptions of these awards are taken from the individual proposals.

CAREER: Selective Thermal Processing of Biomass-derived Oxygenates by Catalytic Fast Pyrolysis (Award 0747996, University of Massachusetts, Amherst, MA). Lignocellulosic biofuels will become increasingly important as our society moves away from petroleum-derived resources. The current roadblock for lignocellulosic biofuels is the lack of economical conversion processes. The ideal process would selectively produce a liquid biofuel from solid biomass in a single reactor at short-residence times without co-feeding hydrogen. The hypothesis of this project is that aromatics, alkanes and olefins, all potential biofuels and biofuel feedstocks, can selectively be produced from thermally unstable biomass-derived oxygenates in the gas-phase using appropriate heterogeneous catalysts. The project will provide the foundation on which an integrated program that combines research, education and outreach focusing on catalysis and biofuels will be developed.

Metabolic Engineering (ME): Genomic and Genetic Approaches to Solvent Tolerance in Anaerobes (Award 0331402, Northwestern University, Evanston, IL). This project aims to understand the molecular basis that determines tolerance of the industrially important anaerobic clostridia to solvents. The hypothesis is that the molecular basis of what makes bacterial cells able to withstand high solvent concentrations can be used to metabolically engineer cells to tolerate higher concentrations of solvents and related chemicals.

Based on data from current funding, overexpression of heat-shock (stress) proteins (HSPs) was shown to confer increased ability to produce and tolerate high butanol concentrations. These traits were likely due to the stabilizing effect of HSPs on the cellular machinery. A specific aim of this project is to use the concomitant overexpression of HSPs and metabolic genes for generating strains, which produce and tolerate high levels of butanol.

Small Business Innovation Research (SBIR) program, Phase I: Identification of a suitable butyraldehyde/butanol dehydrogenase for a heterologously expressed butanol pathway (Award 0712641, Gevo Inc., Pasadena, CA). Butanol has several advantages over ethanol for fuel. It can be made from the same feedstocks as ethanol but it has the potential of being stored, transported and used in the same manner as gasoline. Butanol can be produced using Clostridium strains but this process is relatively inefficient and produces large amounts of byproducts. This project will aid in developing microorganisms capable of converting biomass to butanol with greater efficiency than Clostridium and without byproducts.

The broader benefits of the technology developed by this project will be the potential of providing a second generation renewable transportation fuel, reducing dependence on imported oil, lowering greenhouse gas emissions, and expanding markets for agricultural products worldwide.

Partnerships for International Research and Education (PIRE) - Molecular Engineering for Conversion of Biomass-derived Reactants to Fuels, Chemicals and Materials (Award 0730277, University of New Mexico, Albuquerque, NM). This project brings together four U.S. and four European institutions to investigate critical steps required for chemical transformation of biomass-derived reactants into useful products. Together, the team will work to improve our understanding of innovative molecular engineering for conversion of biomass-derived reactants to fuels, chemicals and materials.

The educational aspects of the collaboration provides multi-faceted international experiences for sixty U.S. graduate and twenty undergraduate students. The resulting internationally distributed, virtual center should help research partners pursue compelling research questions associated with biomass conversion and enhanced engineering of metal catalyzed reactions.

Small Business Innovation Research (SBIR) Phase I: Evaluation of recombinant HED2 proteins as synergists for cellulosic biofuel production (Award 0739966, Expansyn Technologies, Inc., State College, PA). This project will explore the feasibility of recombinant expression and use of selected plant proteins to enhance cellulase performance in the conversion of cellulosic biomass to simple sugars for production of biofuels. It is widely recognized that measurable improvements in enzyme performances are required in order to reach an economically viable, biomass-based, fuel production process.

Cellulosic biomass is an attractive energy feedstock because supplies are abundant but current methods to break down biomass into simple sugars for fermentation into ethanol are inefficient, constituting a significant barrier to producing ethanol at volumes and costs competitive with gasoline. The recombinant proteins will be assayed for cellulase synergism using commercial cellulases and biomass samples under conditions that approximate industrial processes.

Collaborative Research: Process Informatics for Chemical Reaction Systems (Award 0535542, University of California Berkeley, Stanford University, Massachusetts Institute of Technology). A multi-institutional team is jointly developing new tools and cyberinfrastructure for chemical kinetics data. This interactive database is essential for understanding and modeling complex combustion processes.

National High Field Fourier Transform-Ion Cyclotron Resonance Mass Spectroscopy Facility, Petroleomics Project (Award 909502, National High Field Magnet Laboratory). This project in Florida has developed a method for "fingerprinting" petroleum. Subtle chemical differences allows the researchers to identify petroleum based on its origin and subsequent processing.

Center for Enabling New Technologies through Catalysis at the University of Washington (Award 0650456, University of Washington and research partners at the University of Wisconsin, University of California Santa Barbara, University of Illinois Urbana Champaign). A new center is developing novel processes that can transform plant-derived carbohydrates into transportation.

Center for Enabling New Technologies Through Catalysis at the University of Washington (Award 0434568, University of Washington). Under the auspices of this center, a collaborative effort between Rutgers University and the University of North Carolina Chapel Hill has developed new ways to efficiently transform two six-carbon chains (relatively low value) into a two-carbon chain (useful heating gas) and a ten-carbon chain (component of diesel fuel).

International symposium between the US and Brazil (Award 0609984). Goal is to initiative, sustain, and develop strong collaborations and partnerships for crop-based biomass and biofuels, including discussions of standards and metrology, storage and transportation, and byproducts chemistry.

GOALI Award: An investigation of Depolymerization and Condensation Reactions of Lignin Under Alkaline Conditions (Award 0553323, SUNY College of Environmental Science and Forestry and Andritz, Inc,.). This project seeks to understand the fundamental chemical processes that occur when celluloses and lignins are hydrolyzed under different conditions.

Several research efforts are seeking ways to remove impurities or more clearly combust hydrocarbon fuels:

- Western Washington University - exploring metal phosphides as catalysts to remove sulfur and nitrogen impurities from crude oil (Award 0503777).
- San Francisco State University - developing improved nanoporous zeolites used in petroleum refining and other catalytic processes (Award 0645814).
- University of California Santa Barbara - developing new magnetic resonance techniques to be able to image chemical reactions occurring inside porous catalysts (Award 0645536).
- University of Utah - accurately measuring kinetic and thermodynamic data on key combustion reactions (Award 0748790).
- University of North Carolina at Asheville - understanding combustion and reactions of combustion products, especially hydrohaloalkanes (Award 0647582).
- University of Maryland College Park - developing catalysts that tolerate water and allow the production of oxygenated fuels in an environmentally friendly manner (Award 0614798).

Mr. LATHAM. What we do in this area is absolutely critical. We passed the energy bill last year with substantial renewable fuel standards. And a great deal coming from cellulose production of fuels.

And we are not there. With current technology, there is no way we are going to meet that standard. And that is why I think your research is absolutely critical.

Dr. BEMENT. Cellulose is about the only pathway forward. So we have to crack that.

Mr. LATHAM. I guess I have a few other questions I would submit for the record. Is Culberson really with you on this stuff?

Dr. BEMENT. We would welcome any of you to come to NSF and spend some time with us.

AGENCY STEWARDSHIP

Mr. LATHAM. In your brochure here with your budget request—I understand the pie chart here and the discovery learning, research infrastructure, etc., and the $404 million of stewardship.

From the description, I don't know exactly what this is, "Support excellence in science and engineering research and education through a capable and responsive organization." I am not sure what that is. Maybe it is——

Dr. BEMENT. That——

Mr. LATHAM. Maybe it is me. But what is "a capable and responsive organization"?

Dr. BEMENT. Almost the bulk of that is for agency operation and award management expenses. That includes salary and space. But it also includes our management of the whole grant processing cycle and also our pre-award and post-award auditing of performance under those grants. So it is something that involves the whole agency.

In addition to that, it also includes support for physical security, as well as our information systems within the agency: Systems like FastLane, which is how proposals come to the Foundation, but also systems within the Foundation for processing those proposals. It deals with many other administrative systems that we have.

And it also helps support upgrading some of our technology systems within the Foundation, which because of shortfalls in this account over the last two or three years, have gotten pretty seedy and really need to be replaced or refurbished.

Mr. LATHAM. Maybe if you just point administrative costs, ongoing expenses to run——

Dr. BEMENT. This is within the five——

Mr. LATHAM. It may be a little clearer to me anyway.

Dr. BEMENT. This is within our five percent overhead that makes the other 95 percent worthwhile.

Mr. LATHAM. Thank you very much. And keep up the great work. Appreciate it.

Mr. MOLLOHAN. Mr. Frelinghuysen.

INTERNATIONAL COMPETITIVENESS

Mr. FRELINGHUYSEN. I just have a few sort of general comments. You know, as I read this report, and I know this is a distillation of a much larger report, Dr. Beering, there is some level of optimism.

Dr. BEERING. Yes.

Mr. FRELINGHUYSEN. But then there is a sort of an onset of somewhat pessimistic projections. You know, we are three years into the American Competitiveness Initiative. And I am not quite sure how we judge our success to date, how you would. How do we define and measure how we are doing in the competitiveness arena?

And I don't want to have this a play on words. But, you know, when you talk about the American Competitiveness Initiative, and I don't mean to be Chinese centric here, but let us say that there is a countervailing for us in the Pacific known as Chinese competitive initiative. They have quite a different system of government. And they can make things happen.

We have our own stove pipes. We have our structure. We have our own, these days, architecture, all this. You know, I sort of would like to have a better handle as to how we are doing relative to what appears to be in your own words here, "their acceleration on a lot of fronts."

I serve on the Defense Appropriations Committee.

I get the view that they are doing things in their education system, obviously, dealing with a massive population. But they are teaching English starting in the second or third grade. I mean, we would have to have one major transformation in our country to meet the Chinese competitive initiative, if there is one.

I sort of was sharing somewhat anecdotally when I should have been paying attention. I was so enthused by Congressman Culberson. We look towards the next budget cycle. And, you know, that the fact that 1,000 young people might not get their scholarship grants. But our Chinese competitors, and I am not picking on the Chinese, I am hugely admiring, they are looking towards 10 or 15 or 20 years.

Here we are on the edge of a recession. They are not immune to the things that are out there. They may, in fact, in some ways contribute to it. Some say they might provide stability by owning our paper. They maybe even own some of our subprimes. Somebody's got to own them.

I want to sort of get your take on where we are going. I am not an alarmist. There is a little bit of sugarcoating here.

Would you react to my statement? I know I have been all over the map. But I think we are dealing with a major power here that really has got its act together.

Dr. BEERING. I guess a good summary would be that we are not falling further behind in this particular set of indicators, as compared to previous two-year reviews of that. And we admire what they are doing in the Far East. And certainly there are cultural differences that are profound.

The individual initiative that is exhibited by Koreans and the Chinese students is extraordinary. We see that in our own universities when they come here. They work day and night. They don't seem to need to sleep or eat. They are just constantly engaged. And it is tough for our students when they see an Asian student in their midst to try to out compete that person. So they just give up. They say, “Well, we know they are smart. They wouldn’t be here otherwise. They work harder. And so we will just let them do their thing.”

And when you go over there, which I have done, and you see what happens there, it is astounding. They bring their mats to the office and to the laboratory. They don’t even go home. And they are just there. They work. That is a cultural thing that I don’t think we can bring about here.

I see some of this in Ireland by the way where I have also visited. And the parent involvement there is profound in their K–12 system. And it is not acceptable to drop out of school like we have a huge problem here with school drop outs all over the country. It is just not done. And the parents see to it that the kids do their homework. They actually come to school with them. And they help the teachers in the classroom. And it is a kind of a community effort.

Well it is not a community effort in the United States unfortunately. And we hope that we can focus ourselves on these challenges and do better.

Mr. FRELINGHUYSEN. To some extent, you know, obviously we don’t want to denigrate our own system. Obviously, part of what we want here is to have the workforce of the future.

Dr. BEERING. Yeah.

Mr. FRELINGHUYSEN. We know where their workforce is. They are pretty demonstrative now. They are not waiting. A lot of countries are not waiting.

And then, we ring our hands obviously at the loss of our industrial base, which is pretty difficult to ever recapture.

Dr. BEERING. Right.

Mr. FRELINGHUYSEN. I obviously congratulate you for all your public service. But I worry that this report doesn’t dramatize the situation enough.

Dr. BEERING. Well I think you are quite accurate in this characterization, because we tend to react to crisis in America. And unless we see a desperate situation, we don’t rise up as a group to meet it.

And this situation hasn’t been characterized as desperate by individual school districts or states by any means.

SUPPORT BY SCIENTIFIC DISCIPLINE

Mr. FRELINGHUYSEN. Well, I think we need a little bit of shock treatment here. I am not sure who is going to perform it. Certainly, politicians being respectful of institutions and the way things are done, I am not sure we are the best administrators. But, obviously, we have some responsibility.

I am not unhappy with your response. I am that we can’t do more.

The cornerstone of our American Competitiveness Initiative is the national science basic research, a pretty healthy increase of 13.6 percent. The biggest increases are for physical and computer sciences and engineering. We have somewhat talked about this.

Why are we specifically prioritizing these disciplines? And are they matched? Are they somewhat related to what I am talking about in a more general sense as to what may be happening in the Pacific or for that matter let us say within EU countries?

Dr. BEMENT. I think the reason for that is primarily the reason why it was recognized in the American Competitiveness Initiative. This really deals with our innovation system and where the critical needs are at the present time to support that system.

Unfortunately, the physical sciences and engineering, which are key drivers, have not been given adequate attention over the years. In fact, overall funding in costs and dollars is almost halved in the last couple decades.

And so that needs a shot in the arm. That doesn't in any way say that other disciplines are any less important.

The one thing I would caution, however, is don't just look at the organization chart and assume that that is where all the work is being done.

Biosciences, for example, has an increase of about 10 percent, which is the largest increase they have had in about eight years.

But the point is that everyone in the Foundation recognizes that we are in the biocentury. So you are going to find in math and physical sciences significant programs in biophysics, biochemistry, biomaterials. And our CISE directorate, computer directorate, you are going to find significant work in bioinformatics. And in our engineering directorate, you are going to see significant work in bioengineering.

So it is threaded throughout the Foundation. And our polar programs, a good part of our polar program, as you saw in Antarctica, is biorelated.

But it is important that we do support the biosciences, because that is where the fundamental work is being done. That is where the basic concepts are being developed all the way from the molecular scale up to the organismic scale and the ecological scale.

So that has to be supported well. And it has to be the backbone of all the other Foundation efforts that we have.

Social behavioral sciences are also interconnected with almost all of our advanced technology programs, because all those programs have a human dimension. They have a human element that has to be attended to.

And that is especially important in human machine interactions. How do you adapt humans to machines, and how do you adapt machines to humans? How do you develop virtual organizations? That is a symbiotic relationship, because advanced computer technology enables virtual organizations. But if you don't have the social component of virtual organizations, it is not going to be very effective.

But in setting our budgets, we not only wanted to increase and strengthen all of our disciplines, but we also wanted to pay attention to alignment with the American COMPETES Act and also the American Competitiveness Initiative.

Mr. FRELINGHUYSEN. I appreciate your view. I must say, one of the things that Chairman Mollohan and I heard quite a lot of yesterday from Dr. Marburger is the whole issue of imbalances. That is pretty worrisome here. He somewhat is a gatekeeper, overseer, as I suppose you are, Mr. Chairman. I know you are doing your level best to educate us to fill the gaps. But I must say there was a sort of unease we had.

Dr. BEMENT. Well, as an interdisciplinary agency, we can't serve our community, and we can't serve the Nation unless we keep all of our disciplines strong.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Mr. Culberson.

NANOTECHNOLOGY RESEARCH AND PARTICLE PHYSICS

Mr. CULBERSON. Mr. Chairman, I will be as brief as I can. But I wanted to ask in particular about nanotechnology research that you see being done around the country and what NSF is doing in particular, because while I am passionate about the sciences, the nanotechnology is something I am particularly enthusiastic about. I am convinced it will revolutionize the 21st century and the future in ways we can't even imagine. And certainly affect our future in this century in much the same way that oil and electricity affected the 20th century.

And I just wanted to ask you to talk to us about what NSF is doing in supporting and funding nanotechnology.

And then secondly I noticed also you have specified that you are paying particular attention to particle physics. And I assume that is because the Department of Energy for whatever reason has decided we don't need particle accelerators in the United States, which I think is appalling. I understand most of the research money is going to Europe. And I think in the very near future we could be in a situation where there will be no particle accelerators in the U.S.

So I want to ask you about nanotechnology and particle physics.

Dr. BEMENT. The facilities that we support in particle physics are pretty much accelerators and light sources that are used as tools to study materials, study other substances.

We are not trying to delve into that kind of work. Although we are part of the Large Hadron Collider. So we are doing some theoretical work. But——

Mr. CULBERSON. Individual research——

Dr. BEMENT [continuing]. I want to keep this—I am sorry, go ahead.

Mr. CULBERSON. Individual research—do you more focus on individual research projects——

Dr. BEMENT. Well——

Mr. CULBERSON [continuing]. And the Department of Energy is investing in infrastructure to build the——

Dr. BEMENT. Yeah.

Mr. CULBERSON [continuing]. Particle?

Dr. BEMENT. You are absolutely correct. The Department of Energy at their national laboratories build user facilities. And we support the users. At least we support a large fraction of users.

Mr. CULBERSON. Is it accurate to say DOE is, you know, shrinking our investment in particle physics? I have been a subscriber to journals Nature and Science for years. And it is my impressions from reading those articles that there is a real alarm among scientists that all the particle accelerators are going to wind up being in Europe. And we are just simply not replacing, or enhancing, or building new facilities in the U.S. Is that correct?

Dr. BEMENT. From my vantage point, the Department of Energy has been a champion for particle physics. And they—it is not just particle physics but nuclear science in general. And I don't think anyone in the Department of Energy is happy with the 2008 appropriation.

Mr. CULBERSON. Right.

Dr. BEMENT. That really cut nuclear science and particle physics, which really put on the brakes where they wanted to go.

NANOTECHNOLOGY RESEARCH

Mr. CULBERSON. Well if I could then in the brief time we have got, because I know that everybody needs to wrap up. But talk to us a little bit about the nano research and where you see that.

Dr. BEMENT. The nano research is robust. It covers every field of nano science from engineering, to nanoparticles to device technologies to nano manufacturing.

Mr. CULBERSON. I am sorry, sir. Can you expand?

Dr. BEMENT. But, again, this is another example. We not only have our own nanocenters, which serve the interests of the academic community, but we also support researchers that use the Department of Energy facilities and other nano facilities as well, which gives us tremendous leverage.

The one area that we have increased funding for in the 2009 budget is in the area of environmental health and safety of engineered nanoparticles. And we are working with NIST, with the Department of Energy, and other agencies, especially the regulatory agencies, EPA and so forth, in trying to understand fundamentally what risks there may be in these particles being in the environment, being ingested in——

Mr. CULBERSON. It is particularly important, because we don't want the country to react as the Europeans did to the bioengineered—like corn and other products.

Dr. BEMENT. Right.

Mr. CULBERSON. But specifically if I could ask you, because I am also convinced nanotechnology will—from what I have seen at Rice University with the single-wall carbon nanotubes, allow the country to become energy independent.

Dr. Richard Smalley was a friend who passed away about a year and a half ago. He actually developed and had on the drawing board a device about the size of a washing machine that would store enough electricity. You could buy electricity off the grid at night when it was cheap. And then use it during the day to run your entire house, charge your automobile. And if you invest in this technology and this was distributed out throughout the country, I think he told me that if as few as 30 maybe 40 percent of the households in America had this washing machine sized device to store electricity, that we would then be completely free of foreign oil.

And it would just completely revolutionize the electrical grid. A single wire of carbon nanotubes is smaller than your little finger and will carry ten times the electricity carried to one of the giant overhead towers from Los Angeles to New York with zero loss of electrons due to either radiation or heat, because they don't conduct. It is ballistic transmission of electrons, because it is a tube like this.

So it also has the promise not only of allowing us to identify and cure human diseases, but making the United States completely energy independent, correct?

Dr. BEMENT. When we lost Dr. Smalley we lost one of our great visionaries in nanotechnology. And NSF takes pride in supporting the research that he did. And there is a great deal that can be done with nanotechnology. We have only scratched the surface.

Mr. CULBERSON. These are competitive review grants, Mr. Chairman, and I just in conclusion want to point out that the NSF has been magnificent in supporting this type of work. I wanted you and Mr. Frelinghuysen to know both that, for example, NASA, which we will also hear from later actually had a signed contract. Well I am, you know, NASA does great work but is an example of the difference between the way NSF, which is driven by science, and NASA, which is driven both by bean counters and bureaucrats, is that NASA actually has a signed contract with Rice University for $6 million to invest in infrastructure at Rice to develop the quantum wire, which I just described, which would have revolutionized the electricity conduction, every device that we use. Anyway, signed contract, Rice went out and hired physicists, brought in graduate students, was building the facilities. And then the new NASA Director came in and said, “No,” and tore the contract up. It is just maddening. And you just do a magnificent job at NSF. We just need to find a way to further insulate you, I think, from politics and do what we can to help NASA limp along.

Thank you very much. It is a pleasure to be on this Subcommittee with you, Mr. Chairman and Mr. Frelinghuysen, and thank you for what you do.

Dr. BEMENT. Thank you.

FACILITIES MANAGEMENT

Mr. MOLLOHAN. Well, it is good to have you on the Subcommittee, sincerely. You talk a lot about accountability in your justification. You talk about reviewing projects. You talk about delaying funding for projects. And that suggests to me that you have some issues in that account. I just wanted to give you an opportunity to talk about it at the hearing.

Dr. BEMENT. Yes, thank you. Almost from the time I came to the Foundation there was activity underway to address concerns of the Congress in the management of our facilities account, which led to a study by the National Research Council, which I was fortunate enough to begin implementing with a Deputy. So that led to a lot of internal activity within the Foundation to develop a facilities manual in managing these facilities, which we wanted to be the very best in government. And that facilities manual has been in place. We have been actually operating against it. It has been presented to the Board. The Board has approved it. But we were left with a lot of legacy facilities, because these are multiyear projects. So we just could not go back and redo all the projects to force fit them into the manual. But now that the manual has issued we do have new projects in the wings, and we want those projects to comply with the manual. And one of the——

Mr. MOLLOHAN. How many projects?

Dr. BEMENT. We have one, plus three. Advanced LIGO will start in 2009, and then we have three in the wings. The Ocean Observatories Initiative, the Alaska Region Research Vessel, and NEON, the National Ecological Observing Network. And ATST as well. Now for those projects going forward, we want to employ the rigor that we built into our policies and our practices in managing these projects. And one of the requirements is that they meet a rigorous final design review before we submit the proposal to the Board for approval to put funding in our budget. Because without that final design review there are risks, there are issues that carry over. We are constantly redoing the base lining of our budget. We are changing the contingencies. And in many cases, if we cannot fit within the assigned budget we have to descope the project, which detracts from meeting the scientific requirements that the facility was designed for in the first place. I am convinced we can do a lot better, and that is what we are proposing to do.

Mr. MOLLOHAN. Do you have some troubled projects right now?

Dr. BEMENT. No, I would not say that we do. I think all of our projects, the one area where we have some difficulty is in ship building because of the fact that shipyards are full. We have hyperinflation in commodities, steel, and so forth. If you lose time then, of course, the price of these commodities goes up. And in just keeping projects on schedule, we are pretty much at the mercy of the shipyard because our projects are not of a scale that they want to divert all that much engineering and high skilled technical labor away from other, more lucrative projects. So we are always fighting with shipyards to pay attention to their contract.

Mr. MOLLOHAN. So all of your projects are within budget and on time?

Dr. BEMENT. All of our projects are within budget. They are not all on time. The one where we have slipped is in the Scientific Ocean Drilling Vessel, and that is one of the shipyard problems I was talking about. That will be delayed about six months. But it will be ready for shakedown testing this summer, and we expect to have it in operation this coming fall.

Mr. MOLLOHAN. Are you familiar with all the specifics of these projects? You may not be able to answer all of them.

Dr. BEMENT. I would say yes. I get reports every month and I read them.

Mr. MOLLOHAN. Well that is good. NEON, is it within budget and within schedule?

Dr. BEMENT. NEON, we are not asking for additional funding until, again, it complies with our manual. That will have its final design review this summer and any issues from that design review will have to be resolved before we come forward with any more funding requests. But NEON has come a long way. It is really a very attractive project right now. It will be transformational.

BENEFICIARIES OF LARGE FACILITY CONSTRUCTION PROJECTS

Mr. MOLLOHAN. Typically, who are the beneficiaries for these projects?

Dr. BEMENT. The science community at large. These projects are proposed by the science community. They are initially funded under the Research and Related Account in order to develop the concept, to be sure that the design of the facilities meets all the scientific requirements. And those scientific requirements are set by numerous workshops with the community in order to be sure that, first of all, they are feasible, and secondly that they are affordable. So there is a lot of give and take in changing the scope of the project in order to be sure that the funding that we ask for is, first of all, adequate, but not unreasonable. So that is pretty much how the process starts.

Mr. MOLLOHAN. And it would be an academic institution? A federal laboratory?

Dr. BEMENT. Usually they come from academic institutions or from community organizations representing the community.

Mr. MOLLOHAN. Is there a matching requirement for these projects?

Dr. BEMENT. No.

FUNDING FOR FACILITIES PLANNING

Mr. MOLLOHAN. No? There is a difference of opinion, or a consideration and reconsideration, among the Board and the Foundation, you, about how the initial planning, the funding, might be achieved. Could you talk with us about that and where that issue is? And ask Dr. Beering to address that as well.

Dr. BEMENT. Let me dispel that notion. I asked the Board, actually, to get involved earlier in the development of our projects as they come through the horizon stage and before they go into our readiness stage.

Mr. MOLLOHAN. Mm-hmm.

Dr. BEMENT. So we are actually welcoming their recommendations and we want to work more closely with them so that we get their——

Mr. MOLLOHAN. Well you know, honestly, my point is not that there is a disagreement. My point is just understanding, letting you talk about how the planning should be funded and what you think about that. And just share your ideas, and have you reach a consensus on that.

Dr. BEMENT. All right. Let me address that. Up to the point where we satisfy all the scientific requirements we feel that that type of planning and design should be carried under the Research and Related Account, because it really deals with science issues.

Mr. MOLLOHAN. It ought to come out of the Directorate?

Dr. BEMENT. And that comes out of the Directorates.

Mr. MOLLOHAN. And why is that? Is that because they are closer to the substantive need?

Dr. BEMENT. Some of these projects are very complex. Some of them require research and development, in some cases a lot of development. And they deal with very complex science issues, which are better dealt with by the science community.

Mr. MOLLOHAN. This question of whether this project is more important scientifically than another project?

Dr. BEMENT. Well, this is where the prioritization comes through the Board, and this is why we would like to get the Board involved earlier in the process so that the prioritization starts earlier. But there are special circumstances as the project matures. Once it has passed a preliminary design, it pretty much has satisfied all the scientific requirements. Then you start getting into a preconstruction phase, which deals with things that have nothing to do with science, like site preparation.

Mr. MOLLOHAN. Mm-hmm.

Dr. BEMENT. Like meeting changes in regulations——

Mr. MOLLOHAN. Mm-hmm.

Dr. BEMENT [continuing]. Which requires some reconstruction. Those types of burdens, we feel, should really be assigned to the MREFC account, under construction, rather than under science in the R&RA account.

Mr. MOLLOHAN. And right now it is with science?

Dr. BEMENT. And right now it is with science. And so this is where the Board and the Foundation have been working together in trying to come up with a better approach.

Mr. MOLLOHAN. Dr. Beering, do you have thoughts on that?

Dr. BEERING. Yeah. We want to be and are eager to be helpful in early planning and be involved in the entire scoping of the project. And there has been a misperception on the part of some of the scientists and others involved that the granting of planning funds means that the project is automatically approved at the end of the planning cycle. We want to make sure that that misperception is clarified, that planning is planning. That the project approval comes after that.

Mr. MOLLOHAN. Typically or has that always been the case?

Dr. BEERING. Well, it has been confused. But I think we are together on it now.

Mr. MOLLOHAN. No, no. I mean, as a matter of fact has, if someone gets approved at the, I am hoping I am using the right characterization——

Dr. BEERING. Yeah, at the planning stage.

Mr. MOLLOHAN [continuing]. At the Directorate or the planning stage in the past, did that equate to automatic funding for construction?

Dr. BEERING. I think most of that time that has been the case.

Mr. MOLLOHAN. Have there been any exceptions, just to——

Dr. BEERING. I cannot answer that.

Mr. MOLLOHAN. Okay, it does not matter. No, no, there must have been exceptions.

Dr. BEMENT. We have stretched some projects out until they were much better defined and until we had a more credible budget.

Mr. MOLLOHAN. Is there a difference of opinion here or is there a consensus? You are asking for an authorization here from this Committee, so we have to understand.

Dr. BEMENT. I think all the projects that are in our funding request, asking for authorization, have been approved by the Board and so they have pretty much gone through this process.

USE OF MREFC FUNDS FOR PLANNING PURPOSES

Mr. MOLLOHAN. But as I understand it, you are asking for an authorization to use the construction money for planning purposes.

Dr. BEMENT. Correct.

Mr. MOLLOHAN. And that is something that you are not allowed to do now.

Dr. BEMENT. That is correct. So——

Mr. MOLLOHAN. So the point of my questioning is that we want to feel comfortable. I mean, we are not in the authorization business. It is tough for us to think about even authorizing it. But we do want to feel comfortable that there is a consensus and if there is not, we would like to know.

Dr. BEERING. No, we are together on it.

Dr. BEMENT. I think there is a consensus. I think there is a meeting of the minds on that.

Mr. MOLLOHAN. Okay. And so you are requesting of this Committee with regard to this what?

Dr. BEMENT. What I am requesting is, if there are circumstances beyond the establishment of scientific feasibility for a project that is more related to preconstruction or construction that that be included as part of the MREFC budget for that project.

Mr. MOLLOHAN. Is that stated correctly? Okay, thank you. Mr. Frelinghuysen.

MREFC ACCOUNT PROJECTS

Mr. FRELINGHUYSEN. We are a little bit past high noon here, so I do not want to keep you here. I am not sure what the Chairman's plans are. I just want a little clarification. Your request for this account is reduced by a third, right?

Dr. BEMENT. Yes.

Mr. FRELINGHUYSEN. And that is largely due to the fact that these three projects are being deferred——

Dr. BEMENT. Until they pass final design review.

Mr. FRELINGHUYSEN [continuing]. Until they pass?

Dr. BEMENT. It is not only final design review, but they have to have a risk management plan. They have to have a supportable contingency. And so, at the time we start construction all these early issues are pretty well resolved.

Mr. FRELINGHUYSEN. But as you defer these, you are moving ahead with a new project? The Advanced Technology Solar Telescope?

Dr. BEMENT. Yes.

Mr. FRELINGHUYSEN. And that obviously is priority number one. Behind that project is a growing backlog, which obviously you are quite cognizant of.

Dr. BEMENT. Well, actually, what is happening is that over the next year, actually this year and next year, we will be completing three or four of our projects. And so the overall budget in the MREFC account will probably dip and then slowly come back again. But I think we are over the hump at this point.

Mr. FRELINGHUYSEN. But at some point in time you are going to have——

Dr. BEMENT. We are going to have three——

Mr. FRELINGHUYSEN [continuing]. You are potentially going to have three——

Dr. BEMENT. Three or four new projects, that is correct.

Mr. FRELINGHUYSEN. Which would mean that you would have a need for some pretty substantial construction funds.

Dr. BEMENT. Yes. But that would not be unusual with regard to the level of funding we have had in this account in past years.

ATACAMA LARGE MILLIMETER ARRAY

Mr. FRELINGHUYSEN. Let me just get a little parenthetical in here. We briefly discussed in our time together what was happening in Chile. Is it called the ALMA Project?

Dr. BEMENT. Yes.

Mr. FRELINGHUYSEN. And of course, the paper underscored the fact that the participants there are anticipating that the National Science Foundation is going to come through for them. Can you maybe shed a little light on that?

Dr. BEMENT. Oh, absolutely. Once you get that far into a project you certainly do not want to disrupt it because then it becomes very expensive.

Mr. FRELINGHUYSEN. So how would you characterize the project? That particular project?

Dr. BEMENT. I think it is on schedule. It is on budget. I think it is going along quite well right now.

Mr. FRELINGHUYSEN. It is the single largest project, is it not?

Dr. BEMENT. It is the single largest and the most complex.

Mr. FRELINGHUYSEN. So just put a dollar figure on it for me?

Dr. BEMENT. Total?

Mr. FRELINGHUYSEN. Yes.

Dr. BEMENT. Let me see if I can——

Mr. FRELINGHUYSEN. The man who wears that raincoat over there. I hear half a billion, but it is a whisper behind me.

Dr. BEMENT. It is, it is actually a jointly funded program between NSF and our partners, and the European Southern Observatory and their partners. They are putting out $500 million, we are putting out $500 million.

RESEARCH FUNDING RATE

Mr. FRELINGHUYSEN. Just a last question. One of the measures of the health of research funding is the funding rate issue, percentage of proposals you are able to fund. I understand that this year you expect to fund 24 percent of the competitive research programs you receive. I understand, and you have added some emphasis to this, with the requested increase you would expect to support approximately 1,370 more research grants in 2008. Will this translate into an increase in the funding rate for research proposals?

Dr. BEMENT. Yes.

Mr. FRELINGHUYSEN. And where do you match up the whole issue of having a greater increase in the number of grants and the whole issue of the increase in the average award size?

Dr. BEMENT. I think the total number of proppsals has stabilized at around 45,000. It was ramping up earlier, and that is why our success rate was dropping. If you just take the competitive research proposals, the ones that we provide grants for, our success rate on average would be about 21 percent as of today. With the budget that we are requesting for '09, that success rate would go up to 23 percent. And it would also enable us to fund well over 1,000 new grants.

Mr. FRELINGHUYSEN. There are those grants and then there are the dollars which focus on the national centers. That is about 5 percent?

Dr. BEMENT. Yes. There are centers, there are contracts. What other categories?

Mr. FRELINGHUYSEN. What is the percentage and does it match whatever Dr. Beering and his colleagues——

Dr. BEMENT. Well, some of those grants are renewal grants. And the reason why the overall success rate looks higher than what I quoted, like 21 percent, is that when you are renewing grants, you are not competing with a lot of other grants. So that the success rate is like 100 percent. So when you average everything in, the overall success rate would be higher than the success rate just for the competitive research grants. And that is why I say today that percentage is 21 percent, and we expect it will go up to 23 percent.

AVERAGE AWARD SIZE

Mr. FRELINGHUYSEN. On the average award size, could you make any comments on that?

Dr. BEMENT. Yes. I think we have that. We can provide that, we can provide that for the record. But it is going up slightly in 2009. I want to say it is about $160,000.

[The information follows:]

NATIONAL SCIENCE FOUNDATION AVERAGE ANNUAL AWARD SIZE

	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate
NSF all	$146,270	$151,355	158,290
Biological sciences	182,246	191,000	200,600
Computer & information science & engineering	139,000	150,000	180,000
Engineering	115,860	116,000	118,000
Geosciences	153,922	155,000	160,000
Mathematical & physical sciences	130,459	145,000	145,000
Social, behavioral, & economic sciences	115,337	115,550	117,810
Office of Cyberinfrastructure	511,682	440,000	440,000
Office of International Science & Engineering[1]	156,673	50,000	175,000
Office of Polar Programs	238,398	245,198	249,398

[1] The spikes in average award size in FY 2007 and FY 2009 are related to Partnerships for International Research and Education (PIRE) competitions, which are held every other year.

Dr. OLSEN. It really depends upon discipline, the average award size, but what we are trying to do——

Dr. BEMENT. Well, across the Foundation we have those numbers and we will provide those for you, what the average award size is. I thought I had it here but I am not finding it.

Mr. FRELINGHUYSEN. Thank you both.

Dr. BEERING. Thank you.

Mr. FRELINGHUYSEN. Thank you. Thank you, Mr. Chairman.

USE OF MREFC FUNDS FOR PLANNING PURPOSES

Mr. MOLLOHAN. Okay, thank you Mr. Frelinghuysen. Dr. Beering, I just want to be clear on this whole question of spending planning funds, or using funds out of the major construction fund for planning, is that decided on the Board? Or is that being now considered by the Board or reconsidered by the Board? What is the status of it within the Board?

Dr. BEERING. Well, we talked about it. And A, we wanted to be involved in the early planning and the total project scoping. And B, we wanted to make certain that the applicants did not confuse planning grants with project grants. There was a two stage process. And I think we are totally in agreement on that.

Mr. MOLLOHAN. But this question of funding planning out of the construction account?

Dr. BEERING. Yeah, we did not really care. The Board did not care which account it came from so long as we all understood how we were doing it and what the administration has proposed is quite acceptable.

Mr. MOLLOHAN. Okay. But you represent here that you are in total agreement?

Dr. BEERING. Yes, we are.

Dr. BEMENT. Mr. Chairman, let me change the wording. It is not really planning. The planning is pretty much done. It is late stage design or redesign as a result of circumstances that are brought about by either changes in construction planning or changes in regulations. And at that point, generally the proposal, or the project, has already gone through a fairly rigorous preliminary design and final design review. But then there are issues that come up after final design that are really preconstruction in nature.

OUTSOURCING

Mr. MOLLOHAN. A couple of questions about contracting out. How has your contracting out your A–76 initiatives affected the mission of the Foundation?

Dr. BEMENT. We have been operating with many of these operations contracted out for a very long time. As a matter of fact, we reached pretty much the bottom of the barrel. So we have had pretty stable operations for some time now.

Mr. MOLLOHAN. Reached the bottom of what barrel?

Dr. BEMENT. Well, in terms of what we can outsource, for contracting out.

Mr. MOLLOHAN. You have exhausted the number of functions you can outsource?

Dr. BEMENT. We started well over twenty years ago contracting out administrative functions, security functions, many of our support functions. There is not a lot more to outsource.

Mr. MOLLOHAN. My question was how has it affected the mission of the Foundation?

Dr. BEMENT. I do not think it has affected the mission, because the oversight of all of those activities are done by the Foundation, and if we need to correct them we will correct them. But I think our mission is being well fulfilled.

Mr. MOLLOHAN. Well, talk to me a little bit more about the quality of the service you get from contracting out and by giving me some examples perhaps of good results that I would be interested in, as well as problems.

Dr. BEMENT. Let me ask my Chief Operating Officer to respond. She is closer to it than I am.

Mr. MOLLOHAN. Certainly. Thank you, doctor.

Dr. OLSEN. We contract out our IT services, the facilities maintenance of our building, those types of activities that are not what we consider essentially governmental. So things like our merit review and that kind of stuff stays within the National Science Foundation. In many cases we have oversight of that and we review the contracts over certain periods to be recompeted. We contract out our cleaning services. And we do not have any issues.

Mr. FRELINGHUYSEN. Maybe you could just give your name for the record, please?

Dr. OLSEN. Kathie Olsen.

Mr. MOLLOHAN. Yes, thank you.

Dr. OLSEN. Oh, and we are red, as you know, in terms of the yellow, red, and green. In terms of competitive outsourcing we are actually red. We have always been red because of the fact that, again, as Dr. Bement indicated under Eric Bloch's leadership, he started looking at things that were not inherently governmental and already contracted them out. So when the President's Management Agenda came aboard, we actually did not really have anything additional that we could consider that we were not already doing to run the Agency effectively.

Mr. MOLLOHAN. Do you have any other additional activities that NSF plans to outsource?

Dr. OLSEN. The only other issues that they had asked me to put on the table is the icebreakers in terms of competitive outsourcing, to say "This is what we need to enable the science" and then have everyone compete for that. But that is not anything I think that in reality——

Mr. MOLLOHAN. What table do you put that on?

Dr. OLSEN. Table in terms of discussions, in terms of internal——

Mr. MOLLOHAN. Who are you discussing it with?

Dr. OLSEN. Internally.

Mr. MOLLOHAN. Who else are you discussing it with?

Dr. OLSEN. Within the Foundation at this point.

Mr. MOLLOHAN. That is all?

Dr. OLSEN. At this point.

Mr. MOLLOHAN. You are not discussing it with OMB?

Dr. OLSEN. Well, we have had that discussion in terms of competitive outsourcing, researching——

Mr. MOLLOHAN. Well, that was my question. Who are you discussing it with?

Dr. OLSEN. Well, I have discussed it recently with Clay Johnson.

Mr. MOLLOHAN. And who is he?

Dr. OLSEN. He is the Deputy of OMB.

Mr. MOLLOHAN. How is the travel service working out for you?

Dr. OLSEN. That is a challenge. It is FedTraveler. It is something that every one of us faces. And we have to look at it, we have some very good staff at NSF that are evaluating that. And it is one that could be improved, let us put it that way.

Mr. MOLLOHAN. What is the "that" you are evaluating.

Dr. OLSEN. Basically, it is very——

Mr. MOLLOHAN. This is really, this is really easy.

Dr. OLSEN. Digging down to sort of the level is very time consuming, it is very difficult.

Mr. MOLLOHAN. What is very difficult and time consuming?

Dr. OLSEN. The actually making the system itself. Okay? And it is just, it is a challenge. And so that is one that we have actually looked at, and whether or not we should, we are trying to work with the contractor to improve that system.

Mr. MOLLOHAN. Are there any other contracting out situations that you are having difficulty with?

Dr. OLSEN. I think FedTraveler is our——

Mr. MOLLOHAN. Well, I know it is, I understand that seems to be the most difficult example. But are there any other examples that you have?

Dr. OLSEN. Not that I am aware of.

Mr. MOLLOHAN. Not that you are aware of? Okay. Thank you.

Dr. OLSEN. You are welcome.

Mr. MOLLOHAN. That was easy. I mean, that was not hard. Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Nothing for me.

Mr. MOLLOHAN. Nothing for you? Would you, gentlemen, like to add to your testimony, or is there anything you think the Committee would appreciate hearing about?

Dr. BEMENT. Well, the one thing that I would have stated at the very beginning was to express my appreciation for the support you gave us in the '08 budget.

Mr. MOLLOHAN. In the early budget.

Dr. BEMENT. I am sorry it came out the way it did.

Mr. MOLLOHAN. In the early budget.

Dr. BEMENT. In the early budget.

Mr. MOLLOHAN. Well, as we said during Mr. Culberson's testimony, the final result was not satisfactory to us and what we want to do was reflect it in our House Bill. And hopefully we will have better opportunities to fund the Foundation at the level that I think everybody on this Committee wants to fund it at in this cycle.

Dr. BEMENT. Thank you.

Mr. MOLLOHAN. We certainly want you to, and we are glad that your request, as you have testified, gets you back on the track that you want to be back on. Dr. Beering?

Dr. BEERING. Thank you. We do not want to be hit by another bus.

Mr. MOLLOHAN. Well, thank you very much for your testimony. Thank you for the good work of everyone, and everyone attending here today.

Dr. BEERING. Thank you. Thank you very much.

[Questions and answers submitted for the record follow:]

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON COMMERCE, JUSTICE, SCIENCE, AND RELATED AGENCIES
HEARING ON
APPROPRIATIONS FOR FY 2009

February 27, 2008

Additional Subcommittee Questions Submitted to
Dr. Arden Bement, Jr.
Director
National Science Foundation

BASIC RESEARCH

Dr. Bement, there has been a downward trend in basic research across the government. An exception, however, in that trend has been the NSF.

QUESTION: How has disinvestment in other federal agencies' basic research portfolios affected the Foundation?

ANSWER: The recent NSF Impact of Proposal and Award Management Mechanism (IPAMM) study considered this issue. The study indicates that the reduced basic research portfolios of some other federal agencies has occurred at the same time NSF is seeing an increase in the number of proposals submitted. However, no clear cause-and- effect relationship can be drawn.

As part of IPAMM, NSF also conducted an extensive survey of investigators. Fifty four per cent of the respondents claimed that decreased funding at another federal agency had influenced them to submit a proposal to NSF (influenced in small degree (23 percent), moderate degree (20 percent) or great extent (11 percent). Further analysis of data shows that investigators in particular areas of science were influenced in higher percentages.

Background

The reduction in basic research has resulted in two causal elements: 1) proposals that have been traditionally funded at R&D accounts within other federal agencies are now coming to NSF; and 2) research is decreasing while development is increasing, which adversely affects innovation and threatens U.S. global competiveness.

QUESTION: How has other federal agencies' disinvestment affected the U.S. posture in global competitiveness?

ANSWER: U.S. R&D investments today, especially in basic research, are a cornerstone of future innovation. It is difficult to determine the exact impact on U.S. competitiveness of any one federal agency's investment in basic research. However, basic research is a foundation of innovation, and the federal government provides two-thirds of its support, and more than half of it is conducted in our universities. The President's American Competiveness Initiative aims to significantly increase R&D investment in the physical sciences and related disciplines, and the Administration hopes that the Subcommittee will support this important initiative given the broad Congressional consensus that led to the passage of the America COMPETES Act of 2007. Other nations have made leadership in innovation and technological competitiveness their strategic economic goals. In support of these goals, they have steeply increased R&D spending, rapidly expanded higher education, and developed technological infrastructure. Many nations have made rapid strides, but none more than China. The Organization for Economic Co-operation and Development (OECD) places China in second place behind the United States in R&D, with spending close to that of the entire European Union. China approaches the EU and Japan in value of high technology manufacturing, and its high tech exports have soared. Such developments in China and other nations will continue to challenge U.S. global scientific and technological leadership.

QUESTION: The NSF request for FY 2009 for Research and Related Activities is nearly $5.6 billion. This is an increase of 16 percent over last year. It is also three times the amount of the FY 1995 appropriation of $2 billion. Over the past decade, that represents an annual average increase of nearly 10 percent, making it one of the federal government's fasting growing domestic programs. That having been said, have these increases been sufficient to fund the top rated proposals submitted to NSF?

ANSWER: The FY 2006 Merit Review report notes that a large number of potentially fundable proposals are declined each year. One measure of the magnitude is the number of proposals highly rated by external reviewers that are declined. Close to $1.9 billion was requested for declined proposals in FY 2006 that had received ratings at least as high as the average rating for an awarded proposal. Over the last ten years, NSF's capacity to fund these highly rated proposals has diminished on average. In FY 1997, the ratio of awards to highly rated declines was 5:1; in FY 2006, that ratio had dropped to less than 2:1. NSF is thus supporting a smaller proportion of potentially fundable proposals.
(www.nsf.gov/nsb/documents/2007/2006_merit_review.pdf)

QUESTION: What is the current rate of funded proposals relative to the number of grant applications? How will the increases provided in the budget lessen that gap?

ANSWER: The table below displays ten years of proposal, award and funding rate trends for all proposals as well as research proposals.

The FY 2009 Request is estimated to improve overall funding rates by 2 percent while accommodating an increased proposal load as well as slightly larger award sizes.

Proposal, Award, and Success Rate Trends

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Proposals	29,427	31,843	35,082	40,084	43,816	41,723	42,375	44,593	48,042	50,000
Awards	9,770	9,834	10,339	10,789	10,367	9,772	10,451	11,484	11,530	13,000
Funding Rate	33%	31%	29%	27%	24%	23%	25%	26%	24%	26%

Research Proposal, Award, and Success Rate Trends

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Proposals	21,442	23,095	25,241	28,677	31,553	31,572	31,520	33,868	35,762	38,609
Awards	6,498	6,218	6,722	6,847	6,509	6,258	6,715	7,481	7,510	8,880
Funding Rate	30%	27%	27%	24%	21%	20%	21%	22%	21%	23%

Source: FY 2000-07: NSF Enterprise Information System as of March 5, 2008.
FY 2008-09: NSF Budget Request.

The Research Grant subset of NSF proposals was developed to identify proposals that represent a typical research grant (as opposed to educational or development grants), particularly with respect to the size of the grant. Large awards (such as centers and facilities operations) and equipment and instrumentation grants are excluded, as are small items such as conferences and symposia. Also excluded are Small Business Grants and Small Grants for Exploratory Research (because the award size for both is established at a particular level by policy) and most EHR grants unless they are specifically related to education research.

QUESTION: If additional funds were provided to the Foundation, where, in your opinion, should they be allocated? Should they be distributed wholly in the Research and Related Activities account?

ANSWER: Given the overall constraints on the federal budget, NSF should not be provided funding above the President's request. If additional funds were provided to the Foundation, they should not be provided solely to the R&RA account. Research infrastructure, STEM education activities, and NSF's own stewardship efforts all would require increased investment to keep a balanced portfolio.

It should be clear that this is an extraordinary budget request. For NSF to be provided a 13 percent increase when non-security discretionary spending is held to an increase of 0.3 percent is remarkable. The American Competitiveness Initiative (ACI) year-to-year increase is 7 percent, but this budget request restores the funding lost in FY 2008 with the Consolidated Appropriations bill. This support by the Administration reflects the importance of NSF's role in U.S. innovation and shows confidence in NSF's stewardship of federal funds.

QUESTION: The Committee has a long standing interest in the specific goals associated with the doubling outlined by the President's American Competitiveness Initiative. What milestones can we look for along the way to be sure that the taxpayers are getting a solid return?

ANSWER: To meet the goals associated with the doubling of NSF's budget through the American Competitiveness Initiative, NSF has established some qualitative performance goals and milestones to demonstrate the return on our investments, and quantitative, concrete targets to show the effectiveness of the added resources. We continue to seek new methods to measure returns on basic research investments.

Specifically, our qualitative milestones in current use are associated with our long-term strategic outcome goals of Discovery, Learning, and Research Infrastructure, and our quantitative targets relate to our Stewardship goal in order to demonstrate the effectiveness of our processes for program management and agency operations.

Detailed information, including milestones and measures, may be found in NSF's 2006-2011 Strategic Plan, in the Performance section of the FY 2009 NSF Budget Request to Congress, and in NSF's Program Assessment Rating Tool (PART) documents. All may be found here: http://www.whitehouse.gov/omb/expectmore/agency/422.html

QUESTION: What are some concrete targets that show the effectiveness of these added resources? What do you expect to see after that ten-year period has been in place in terms of how many more scientists, engineers, educators will we have? How many new products?

ANSWER: We assess progress annually under each goal in two ways: results and process.

For the qualitative assessment under our long-term strategic outcome goals, we ask outside experts to evaluate the results of our long-term investments, specifically the results, or outcomes, reported by our principal investigators. The panels include leaders from industry and academe, who determine whether we are making a difference. These leading experts serve on the Foundation-wide Advisory Committee for GPRA Performance Assessment, Directorate-level Advisory Committees, and Division-level Committees of Visitors. We ask these expert panels to consider criteria such as:

- Have our research grants strengthened fundamental research across the science and engineering disciplines that NSF supports?
- Have we promoted innovation and stimulated the creation of partnerships with industries that led to the development of new technologies and processes to further U.S. economic competitiveness?
- Is there evidence that science and engineering education has been improved?
- Are we adequately preparing the next generation of science, technology, and education (STEM) professionals?
- Are we broadening participation in our programs from underrepresented individuals and diverse institutions throughout the United States?
- Have we contributed to the development advanced tools, instruments, and facilities to support the STEM community?
- Have we expanded access for researchers and educators to state-of-the-art science and engineering facilities, equipment, databases, and advanced computing resources and research networks?

For the quantitative assessment of targets related to our Stewardship goal, NSF monitors its processes by which we operate and manage our programs. We ask questions such as: Do we inform principal investigators about the outcome of the decision process on their proposals in a timely manner? Are our processes for merit review of proposals balanced and transparent? Are we broadening participation among underrepresented groups, diverse institutions, and throughout the United States? Are our large facilities meeting their benchmarks? Is industry participating in our science and engineering centers?

Some of our annual quantitative goals are:

- To increase the percentage of proposals from institutions that are not among the top 100 institutions that NSF funds.
- To increase the number of graduate students supported through our three flagship graduate programs: the Graduate Research Fellowship Program, the GK-12 (Graduate Teaching Fellows in K-12 Education) Program, and the Integrative Graduate Education and Research Traineeships (IGERT) Program.
- To maintain a high percentage of non-academic partners for our major research centers.
- To maintain a high level of efficient operations in our major multi-user facilities, and to keep our facility construction projects on schedule and within cost.

We constantly seek better metrics for describing the returns to the Nation from NSF investments. This is a matter of active research under our Science of Science and Innovation

Policy initiative. We also provide to Congress highlights of current research achievements in our budget submission.

Information on both types of assessments are published in our budget and posted on NSF's Performance Website: www.nsf.gov/about/performance. NSF's Strategic Plan may be found at: www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf0648.

AMERICA COMPETES ACT PRIORITIZATION

QUESTION: Dr. Bement, please discuss for the Committee how NSF is implementing the provisions of the America COMPETES Act.

ANSWER: Immediately after the America COMPETES Act (ACE) was signed into law, a working group was assigned to develop options and recommendations on how to implement the provisions of the Act pertaining to NSF.

To date, NSF has already implemented some of the Act's provisions, such as:

Section 7036, Major Research Instrumentation: With regards to cost sharing for the Major Research Instrumentation Program, implementation actions included issuance of a Dear Colleague Letter to the community, revision of the solicitation, and conducted briefings.

Section 7037(a), Limit on Proposals: For programs that require preliminary proposals as part of the selection process, and that also limit the number of preproposals that may be submitted by an institution, NSF allows the subsequent submission of a full proposal based on each preproposal that is determined to have merit. It should be noted that this was already the Foundation's policy and only one solicitation limited the number of full proposals that could be submitted based on the outcome of the preliminary proposal competition. This solicitation will be corrected when it is next issued. NSF is now in compliance with this provision of the Act.

We are also in the early stages of implementing several other sections, such as:

Section 7008, Postdoctoral Research Fellows: NSF will implement the statute as enacted and also plans to encourage principal investigators to apply this approach to mentoring graduate students.

Section 7018, Meeting Critical National Science Needs: NSF will recommend to the NSB that the relevance of critical national needs be made explicit in the NSB-approved criteria, and that reviewers assess this in the review of proposals submitted to the Foundation.

Section 7020, Cyberinfrastructure: NSF is beginning to identify the "scientific research requirements of broadband access," and to collect recent data that describe the current status of broadband access at relevant institutions. In fashioning a plan, NSF is gathering input from academic institutions, state and local governments, and private sector organizations, as well as organizations like Educause, Internet2, and National LambdaRail whose missions are directly relevant to support for broadband access at colleges and universities.

Section 7026, Laboratory Science Pilot Program: NSF will utilize its investments in cyber-enabled learning to test effective ways for enabling authentic learning experiences for high school students. We have several existing programs that have the capability for doing this, such as the National STEM Digital Library and Innovative Technology Experiences for Students and Teachers.

Section 7030 and Section 10 A, Robert NOYCE Teacher Scholarship Program and Teaching Fellowships and Master Teaching Fellowships: NSF will establish a pilot program that would enable it to probe the features of the fellowship requirements; connect these features with ones undertaken through our other fellowship programs; determine what would be needed to implement the components of the new effort; and establish the pathways through which such programs advance K-12 STEM learning. The baseline assessment of the program, to be completed in December 2008, will also inform possible program improvements to improve the effectiveness of achieving its goals.

Section 7031, Encouraging Participation: This provision is an expansion of existing efforts (e.g. in the PAESMEM Program) and reflects NSF's strong interest in community colleges, STEM education, and the STEM workforce. We will seek to devise highly effective strategies for carrying out increased mentoring within the context of our community college and workforce programs. NSF has already negotiated the types of metrics that we will use through the Academic Competitiveness Council process.

Background

Dr. Marburger, the President's Science Advisor, testified recently that the reason America COMPETES Act is not being implemented broadly is because it does not meet the prior stated goals of the President's American Competitiveness Initiative. The America COMPETES Act is the law of the land, setting prioritization and direction for the Nation's research agenda. OMB apparently has directed the agencies to disregard the priorities of COMPETES and fund only the programs contained in the President's competitiveness initiative.

QUESTION: In the absence of specific appropriations, does the NSF intend to focus available funds on the priority areas contained in COMPETES?

ANSWER: As noted in the examples cited above, NSF has been working diligently to put in place the framework for implementing the Act. Some of the provisions are major new programs and it is important to ensure that the systems put in place to implement them are sound, reasonable, and achieve the desired outcomes.

QUESTION: Can you assure the Committee that we will see the priorities outlined in COMPETES brought forward in your FY 2010 request?

ANSWER: Priorities outlined in the America COMPETES Act will be incorporated into the planning for NSF's FY 2010 budget request, which will be submitted by the next President. Since August 2007, an agency-wide working group has spent considerable time analyzing the Act with respect to NSF's existing programs and policies with the goal of determining how best to implement the ACA. The FY 2008 appropriation does not provide the resources to jump start newly authorized programs or greatly increase existing programs, but we are committed to determining the best way to evolve existing programs to meet the goals of the ACA. If the FY 2009 Budget Request were to be appropriated in full, NSF could begin piloting new programs and transforming existing programs to meet the goals of the ACA.

PROPORTIONAL ALLOCATIONS FOR ALL SCIENCES

The FY 2009 budget proposes an 8.5 percent increase for the social, behavioral and economic sciences directorate compared to increases of 20 percent for the mathematical and physical and engineering and computer sciences directorates.

QUESTION: Dr. Bement, does this lack of proportionality reflect NSF's position that the social and behavioral sciences have only a minimal role in our Nation's economy and competitiveness posture?

ANSWER: No. Significantly, SBE received one of the largest increases of recent years in the FY 2009 Budget Request to Congress.

SBE's Science of Science and Innovation Policy and NSF-wide investments, such as Cyber-enabled Discovery and Innovation and Adaptive Systems Technologies, are increasing as a result of ACI, and these will have substantial SBE participation.

Background

The ACI and the America COMPETES Act both support measurable increases for the physical sciences and engineering as central to economic success and international competition. There are those in the scientific community who feel that only certain sciences are important to the economy and that the so called "soft sciences" – social and behavioral sciences – have minimal import. However, the research portfolio for the social and behavioral sciences are as varied as the physical and natural sciences, focusing on such areas as climate change, risk assessment, economic and political laboratories, virtual centers and learning language.

QUESTION: I understand that the National Science and Technology Council of OSTP is soon to release a report on the grand challenges for the social, behavioral and economic sciences disciplines. Are you aware of the findings of this report and do they suggest that a revision in the proportional increases between the science directorates at NSF need revision both in the FY 2009 budget request and in long-term planning?

ANSWER: The National Science and Technology Council's Subcommittee for the Social, Behavioral and Economic Sciences is comprised of representatives from 17 different agencies and is co-chaired by NSF, NIH, and DHS. The Subcommittee continues to work on a broad visionary framework of the major challenges facing the SBE sciences and their connections to the challenges facing our Nation, but the report will not offer budgetary direction.

QUESTION: If part of keeping American competitive in the 21st Century involves, as Tom Friedman points out in The World is Flat, are the innumerable individual and societal choices that are made with regard to where people study, work and live, their economic decisions, their political decisions, their educational progress, and the influences of culture, the key to America competitiveness is understanding individual and societal behavior. Wouldn't that suggest a more significant role for the social and behavioral sciences in keeping America competitive and therefore larger research budgets?

ANSWER: We agree that understanding individual and societal behavior is important and the FY 2009 Request reflects this by providing a major increase in the research budget for the social and behavioral sciences at NSF.

Dr. Bement, I call your attention to three admonitions with regard to funding levels of the SBE directorate:

- **The report accompanying the NSF appropriations in the Consolidated Appropriations Act of 2008, indicates that the "Committees also believe the Foundation should maintain comparable growth in fiscal year 2008, to the extent possible for the biological sciences and social, behavioral, and economic sciences directorates. Each of the science disciplines is valuable in maintaining U.S. competitiveness."**

- **In Rising Above the Gathering Storm, the recommendation for increasing funding for basic research emphasizes the physical sciences, engineering, mathematics, and information sciences. It also says that there should not be a "disinvestment in such important fields as the life sciences and social sciences."**

- **The America COMPETES Act includes language that the Director shall give priority...in the allocation of Foundation resources to proposes research activities...that can be expected to make contribution in physical or national science, technology, engineering, social sciences, or mathematics, or that enhance competitiveness, innovation, safety, and security in the United States."**

QUESTION: Do you believe that your FY 2008 current budget and your FY 2009 budget request follow these admonitions with regard to the SBE directorate?

ANSWER: Yes. NSF's FY 2009 Budget Request to Congress projects a 19 percent increase in the number of researchers and research awards funded in SBE; the percentage increases are comparable to those projected in other directorates because SBE does not have responsibility for funding and managing major facilities. The 8.5 percent increase for SBE in the FY 2009 Budget cannot reasonably be considered "disinvestment." The America COMPETES Act focuses on three primary areas of importance to maintaining and improving United States' innovation in the 21st Century: (1) increasing research investment, (2) strengthening educational opportunities in science, technology, engineering, and mathematics from elementary through graduate school, and (3) developing an innovation infrastructure. More specifically, the America COMPETES Act authorizes increases in research investments by doubling the funding for NSF from approximately $5.6 billion in FY 2006 to $11.2 billion in FY 2011. If that level of funding transpires, it will offer many opportunities.

QUESTION: How is that possible given that SBE gets no increase in the FY 2008 budget compared to a $16 million increase for the MPS directorate, and in FY 2009, SBE gets an increase of $18 million compared to an increase of $235 million for MPS?

ANSWER: In both FY 2008 and FY 2009, the difference in funding between the MPS and SBE directorates is due to different responsibilities and missions. MPS houses five research divisions and one multidisciplinary office, while SBE hosts two research divisions and one statistics/survey division. MPS disciplines include chemistry, materials research, and physics, all of which have central links to the goals of the ACI and its focus on the long-stagnant investment levels in the physical sciences and engineering.

In addition, MPS and SBE have very different research portfolios. For example, MPS funds many centers programs, such as Centers for Chemical Innovation, the Materials Research Science and Engineering Centers, Science and Technology Centers, and Nanoscale Science and Engineering Centers. MPS center support will total over $114 million in FY 2009, or $20.4 million over the estimated FY 2008 Current Plan. SBE funding for centers is limited to the Nanoscale Science and Engineering Centers, with support totaling $600,000 in FY 2009. MPS also has myriad research infrastructure and facility investments, such as the GEMINI Observatory, the Laser Interferometer Gravity Wave Observatory, the National High Magnetic Field Laboratory, and the National Optical Astronomy Observatories. In FY 2009, over $21 million of the $235 million increase for MPS will support these investments. SBE has no responsibilities for management or support of major facilities.

In FY 2009, SBE projects a 19 percent increase in the number of researchers and research awards funded. This is comparable to and even surpasses projections for other directorates. Historically SBE's annual funding changes have been consistent with or exceeded increases for other directorates, including Computer and Information Science and Engineering (CISE) and Engineering (ENG). In fact, in FY 2006 and FY 2007, SBE's percent increases were greater than that of MPS.

QUESTION: Tell us why more proportional increases across the sciences is not presented in your budget consistent with direction of the Congress and others' findings.

ANSWER: If appropriated, the FY 2009 budget request allocation would provide substantial increases for all NSF directorates and thereby all fields of science. Given limited funding, the Foundation needed to establish priorities and some directorates received more funding than others. This is due to differences in the degree to which they are stewards for major research facilities and centers. It is also dependent on the degree to which they directly and substantially contribute to the nation's economic competitiveness, as articulated in the ACI and elsewhere. The Foundation is not "disinvesting" in any research discipline, quite the opposite.

FUNDING FOR EDUCATION AND HUMAN RESOURCES

Dr. Bement, funding increases proposed for NSF's research and related activities total nearly $6 billion, or 16 percent over the previous year. By comparison, funding for education and human resources is slated for an increase of almost 9 percent.

QUESTION: Given the importance of science education to maintaining this country's competitiveness, why does the budget not provide more equal proportionate increases?

ANSWER: The STEM education and workforce initiatives are not limited to the EHR account. Several of those initiatives are funded primarily or exclusively through the R&RA account, as illustrated by the Research Experiences for Undergraduates (REU) efforts. Moreover, initiatives managed through the EHR account often draw on cross-directorate funding; IGERT and ADVANCE are two examples. Many directorates have their own programs on STEM education, workforce development, or the broadening of participation. These programs tend to address the needs of specific disciplines, in contrast to the more interdisciplinary character of the EHR activities. Indeed, the largest increase in the EHR request is for the Graduate Research Fellowship program, a program which is not discipline specific and which aims to build in general the science and engineering workforce of the Nation.

Background

Funding for the Education and Human Resources (EHR) account is nearly $240 million dollars below its FY 2002 budget in current dollars – which represents nearly 25 percent of its value.

QUESTION: What would you say has been the lost opportunity in terms of education, outreach and public awareness from the historical underfunding of the EHR account?

ANSWER: EHR funding supports a wide range of STEM education efforts – from preK-12 through to graduate students, post-doctorates, and professionals. However, this is not the universe of NSF's education efforts. Across the agency, there are efforts that are NSF-wide and efforts that are discipline specific, and all awards provide educational opportunities. Research funding in the R&RA account supports undergraduate and graduate students and postdocs who are essential to the Nation's innovation system. While it is true that the EHR budget has decreased in real terms since 2003, efforts have been focused on priorities such as broadening participation and addressing critical junctures in STEM education at all levels in order to maximize opportunities. Also, significant progress has been made in establishing partnerships between EHR and the R&RA directorates and offices to leverage resources and achieve greater synergy.

Of EHR's FY 2009 increase of $64.81 million, a significant amount will support the Graduate Research Fellowship (GRF) program, providing support for an additional 700 fellows; will provide support for the Centers of Research Excellence in Science and Technology (CREST), ADVANCE, and the Research on Gender in Science and Engineering (GSE) program to contribute to the ongoing effort to broaden participation; and will fund Discovery Research K-12, supporting development of more effective tools and resources for teachers and students.

Education funding supports activities that contribute to the President's American Competitiveness Initiative and the America COMPETES Act in multiple ways. For instance, there cannot be a technologically competent workforce for the 21st century without scientific and engineering education and training at all educational levels; NSF helps make it possible to retain highly skilled American workers, trained in science, technology, engineering, and mathematics (STEM) fields, which makes the Nation more competitive globally; education also spurs new job growth and economic competitiveness, helps address the workforce needs of the Nation, and helps to ensure a scientifically literate population and a robust pool of talented experts.

QUESTION: I recently became aware of an effort called the Academic Competitiveness Council (ACC), led by Secretary of Education Margaret Spellman, which is to improve the collaboration of STEM education programs across Federal agencies. Can you tell me more about this effort and NSF's role in it?

ANSWER: The ACC was created by Congress to identify all federal STEM education programs and to identify the effectiveness of those programs. Chaired by the Secretary of Education, members are officials from federal agencies with responsibilities for managing existing federal STEM education programs. The duties of the ACC are to:

1. Identify all federal programs with a mathematics or science education focus
2. Identify the target populations being served by those programs
3. Determine the effectiveness of the programs
4. Identify areas of overlap or duplication
5. Recommend ways to efficiently integrate and coordinate the programs.

The ACC reported to Congress its findings and recommendations in May 2007.

NSF Director, Dr. Arden Bement, serves as NSF's representative for the meetings with agency principals. There were three working groups focusing on programs and NSF staff played a leadership role on two of the three: K-12 Education (ED lead), Post-secondary Education (NSF lead), and Informal Education and Outreach (NSF lead).

NSF also co-chairs the National Science and Technology Council's Education Subcommittee which has been working on fulfilling the recommendations of the ACC pertaining to increasing the rigor of evaluation design for individual STEM education programs, increasing evaluation capacity within federal agencies, and coordinating STEM education initiatives.

QUESTION: Would it be true then that the relatively-level funding for many of the EHR programs contained in the budget requests this year and last is because the ACC requires a specific form of evaluation? If so, what is that form of evaluation?

ANSWER: The ACC does recommend that "funding for federal STEM education programs designed to improve STEM education outcomes should not increase unless a plan for rigorous, independent evaluation is in place, appropriate to the types of activities funded." However, this does not mean that a specific form of evaluation is required. Program funding relies on several factors. Importantly, evaluations should address questions of program implementation and impact, and must be calibrated to match the developmental changes that occur as programs become established. In 1992, performance monitoring and evaluation of education programs in EHR became a requirement. EHR has conducted numerous program evaluations since that time. Since 2005, EHR has required that every proposed project include an evaluation plan at the time of proposal submission. Evaluation plans and appropriately rigorous designs are developed for all EHR programs as they evolve.

QUESTION: Does this mean that the Department of Education is setting your EHR budget and the allocations within it?

ANSWER: The Department of Education does not set the EHR budget. Within NSF's overall funding level, priorities are determined and funding levels are set accordingly. It is to be noted that NSF and the Department of Education often collaborate on similarly targeted programs such as the Math and Science Partnership program (MSP). There are ongoing leadership teams representing both NSF and Department of Education, and Memoranda of Understanding are in place for formal collaborative efforts.

QUESTION: I note that the EHR budget request emphasizes five thematic priorities. How do these priorities differ from past efforts and how do they fit with the current set of EHR programs?

NOTE. The five thematic priorities are:

1. **Broadening participation to improve workforce development (to include Innovation through Institutional Integration)**
2. **Enriching the education of STEM teachers**
3. **Furthering public understanding of science and advancing STEM literacy**
4. **Promoting cyber-enabled learning strategies to enhance STEM education**
5. **Promoting learning through research and evaluation**

ANSWER: The five thematic priorities outlined in the Budget Request are designed to assure EHR's continued leadership in STEM research, policy, and practice. They build on past efforts and emphasize synergistic work among programs. They also will help to identify commonalities of purpose and characteristics that link across numerous programs, enhancing the interrelationships among the current set of EHR-supported programs.

QUESTION: Support for Innovation through Institutional Integration is being provided in the form of awards to support this effort. Do you expect that awards will be made for each of the thematic areas in FY 2009 or in future years?

ANSWER: EHR is reviewing options for supporting the thematic priorities as we move forward and we do anticipate awards will be made in each thematic area in the future. In some cases, it may be best to seek proposals linking core programs specifically related to the thematic priority, as in the case of Innovation through Institutional Integration (I^3) being a key component of the Broadening Participation to Improve Workforce Development thematic priority. In other cases support for the thematic priority may be provided through current programs.

QUESTION: It appears that the funding for these efforts is being provided through existing programs, consuming much of the proposed increases for specific education programs. Is this an accurate characterization?

ANSWER: The funding for the thematic priorities should not be viewed as diverting support from core programmatic activities. Funding for the themes will support efforts that are both aligned with the core program efforts and with the overarching theme. Funding for thematic areas will be consistent with the purpose of the program that funds the award.

QUESTION: Can you tell us, for each EHR program, how much FY 2009 funding is being diverted to each of the themes and how much will support core programmatic activities?

ANSWER: The funding for the thematic priorities should not be viewed as diverting support from core programmatic activities. Funding for the themes will support efforts that are both aligned with the core program efforts and with the overarching theme. Funding for thematic areas will be consistent with the purpose of the program that funds the award. The funding for the thematic priorities is shown in the table below.

EHR Thematic Priorities Funding - FY 2009
(Dollars in Millions)

		EHR Thematic Priorities [amount of FY 2009 funding (from program total) that supports thematic priority]					**Other EHR areas of emphasis**
Program	FY 2009 Request Program Total	Broadening Participation to Improve Workforce Development (including Innovation through Institutional Integration)	Enriching the Education of STEM Teachers	Furthering Public Understanding of Science and Advancing STEM Literacy	Promoting Cyber-enabled Learning Strategies to Enhance STEM Education	Promoting Learning Through Research and Evaluation	Workforce Development: Graduate Education
ADVANCE	$1.25	$1.25					
ATE	51.62		5.00				
AGEP	16.75	16.75					
CREST	30.53	30.53					
CCLI	39.21					6.21	
DR-K12	108.50		8.20			100.30	
EASE	5.20		4.60				
SfS	15.00				15.00		
GK-12	49.00		49.00				
GRF	116.70						116.70
HBCU-UP	31.00	31.00					
ISE	66.00			66.00			
IGERT	25.00						25.00
LSAMP	42.50	40.50	2.00				
MSP[1]	51.00	1.50	49.50				
NSDL	16.50				16.50		
Evaluation	10.00					10.00	
REESE	42.00					42.00	
RDE	6.50	6.50					
GSE	11.50	11.50					
Noyce[1]	11.60	1.00	11.60				
STEP	29.70						
TCUP	13.35	12.85	0.50				
Total, EHR	$790.41	$153.38	$130.40	$66.00	$31.50	$158.51	$141.70

1/ Funding supports efforts in multiple thematic priorities. Total dollars in thematic priorities may therefore exceed individual program totals.

EHR Thematic Priorities Funding -- Explanatory Notes

1) Of approximately 80,000 educators who participate in ATE-supported professional development activities, 44 percent are secondary school teachers. It is conservatively estimated that at least $5 million of ATE funding supports the Enriching the Education of STEM Teachers thematic priority.

2) Only the Presidential Awards for Excellence in Mathematics and Science Teaching component of EASE is included in the Enriching the Education of STEM Teachers thematic priority.

3) Within CCLI, it is conservatively estimated that $6.21 million in FY 2009 will support research and data collection efforts included in the Promoting Learning through Research and Evaluation thematic priority.

QUESTION: What is the impact -- in terms of number of awards, award size and award duration -- on existing programs that are being taxed to support these efforts? For instance, how many fewer Noyce scholarships will be awarded as a result of Noyce support for the Innovation through Institutional Integration theme?

ANSWER: The I^3 activity aims to build upon the foundation of various NSF/EHR-funded projects toward the goals of strengthening institutional impact through increased synergy and integration of activities and enhancing their sustainability. As an integrative activity, a Noyce project might well connect with projects from other EHR-supported programs having a focus on K-12 teachers (e.g., MSP, LSAMP Bridge to Teaching). In this instance, the numbers of Noyce recipients are not diminished; rather the experience/training of participants in each of these non-duplicative, related projects would be enriched in a value-added way.

PROGRAMS WITHIN EDUCATION AND HUMAN RESOUCES

Math and Science Partnership program

Dr. Bement, again this year the Math and Science Partnership program is not cut. Rather, the request includes $51 million, an increase of $2.5 million over the enacted level (+5.2 percent).

QUESTION: How many new awards will be funded within this level?

ANSWER: In FY 2008, all of the first MSP awards are in their final year. The program will be conducting a major competition investing $40 million to add roughly 30 new awards to its portfolio. The majority of these awards will require continued support for five years, together with additional support for necessary data collection and program evaluation efforts. MSP anticipates approximately $15 million for new investments in FY 2009. Thus, the program anticipates approximately 15 new awards, strategically invested in each of the key partnership areas: Targeted Partnerships, Institute Partnerships, MSP-Start Partnerships, and Phase II Partnerships

MSP-Start projects were launched as a new feature in the FY 2008 solicitation, to broaden institutional representation, especially from Minority Serving Institutions and community colleges. From the letters of intent submitted, the demand appears high. This need must be balanced against the equally critical need to maintain a balanced portfolio of Targeted, Institute, and Phase II Partnerships for effective program evaluation.

QUESTION: What is the request for Math and Science Partnership awards in the Department of Education in FY 2009? How does that compare to FY 2008?

ANSWER: The Mathematics and Science Partnerships of the Department of Education received $179 million in FY 2008, and the President's request for FY 2009 remains the same. (For more information see:
www.ed.gov/about/overview/budget/budget09/summary/appendix4.xls, line 121.)

QUESTION: Discuss for the Committee how the coordination of the program between the NSF and the Department of Education has changed now that there seems to be a continuing trend to maintain an NSF component to the program?

ANSWER: Coordination between NSF and the U.S. Department of Education (ED) has strengthened as the vision for dissemination of NSF MSP products to ED has now become a reality. Elements of both MSP programs continue to be coordinated at the program level and the project level. Change has occurred at each level in these collaborative efforts as a result of NSF's research and development efforts, and in combination with vigorous networking among all the stakeholders.

At the program level, a highlight of the past year was the December 2007 STEM Summit that brought together nearly 200 higher education faculty from both ED and NSF MSP programs. The Summit focused on sharing what has been learned about the role of mathematicians, scientists, and engineers in teaching and learning, both at the K-12 and higher education levels. In addition, ED annually hosts four national meetings of State Regional Coordinators who are responsible for the state MSP competitions. In FY 2008, NSF staff gave presentations on the new NSF MSP solicitation, NSF 08-525, to share with state level administrators and school district coordinators the opportunities for collaboration with their local institutions of higher education in proposals submitted to NSF.

At the project level, the most important aspect of coordination is the dissemination of research-based courses, tools, and strategies funded through NSF's MSP program. For example, Geogebra, free software developed by the NSF Teacher Institute at Florida Atlantic University (FAU) to promote cyberlearning in mathematics and science, was demonstrated at two State Regional Coordinators meetings. Several states have submitted requests to FAU to provide workshops for their mathematics curriculum supervisors and teachers.

The Research, Evaluation and Technical Assistance (RETA) component of the NSF MSP program continues to support the development of essential tools and other deliverables to inform and assist all Partnerships. Important examples are three NSF MSP-RETA projects, which have developed instruments with attention to psychometric properties, to monitor growth in the mathematics or science knowledge necessary for teaching. These are being used by both NSF and ED MSP projects across the Nation to assess the effects of professional development on the growth of teacher's content knowledge. For example, MOSART, (Misconception Oriented Standards-based Assessment Resource for Teachers) an NSF developed instrument, was adopted by the Georgia Department of Education's MSP Program following a wide ranging search for instruments to measure the efficacy of professional development with respect to science content. Since October 2006, all new proposals to the Georgia MSP Program that involve physical science and earth science are required to show how they will use MOSART items in the assessment of their professional development.

NSF also funds MSPnet: An Electronic Community of Practice Facilitating Communication and Collaboration, which links active NSF MSP projects electronically, for sharing, professional examination and distribution of what is working, where, why and for whom. The structure of MSPnet provides for "common space" that can be accessed by the NSF-funded Partnerships, by the state MSP coordinators, by program staff at both NSF and ED, and others, as well as more "specialized spaces" designed to serve dedicated program and project needs.

Advanced Technological Education (ATE)

The budget request for ATE is flat-footed, held at the same level as provided in FY 2008, or $51.6 million. Last year, the budget proposed to increase ATE by almost 10 percent to initiate one new targeted research project and to support 15 to 20 additional projects.

QUESTION: Why the change of heart this year? Is there no need for additional projects in FY 2009?

ANSWER: NSF remains staunchly committed to the unique role that the ATE program provides in technological education. However, additional funds are not required in FY 2009.

In FY 2008, NSF launched a new small-grants opportunity for institutions new to the ATE program. This was quite successful in broadening participation. Of the approximately 65 new ATE awards that are anticipated in 2008, approximately 20 are being made to institutions with no prior NSF funding. We expect that this opportunity will attract even more applicants in FY 2009.

In FY 2009, in addition to making regular new Project and Center awards, NSF intends to make one large award and a few smaller ones for targeted research studies in technological education. This research is important, because we would like to know not only *whether* particular strategies improve technological education, but *why* they do so and *which students or faculty* they impact the most. This research will inform future directions of the ATE program, as it continues to develop models that other organizations can use in their own programs supporting technological education.

In FY 2007, the ATE program had a funding rate of 29 percent for full proposals submitted for competitive review. The table below presents data on proposals and awards in FY 2007, FY 2008 (in progress), and FY 2009 (projected).

Year	**No. of Proposals***	**No. of Awards***	**Funding Rate***	**Funding Amount***
FY 2007	185	53	29%	$50.58 million
FY 2008	195	65	33%	$51.62 million
FY 2009	220	65	30%	$51.62 million

Notes:

(1) Data for FY 2007 are actual. Data for FY 2008 are estimates; proposals were reviewed on panels in late November 2007, and some award decisions have not been finalized yet. Data for FY 2009 are based on program officers' projections, and on planning that 60 percent of the requested budget will be available for new awards.

(2) These data reflect proposals submitted for competitive review at the ATE program's annual deadline, in response to the program solicitation. Every year, the program also funds a few (typically two or three) unsolicited proposals for workshops and other special projects, as well as a small number of requests for supplemental funding by active projects; and the program typically contributes funds to several awards which are managed by other programs but which impact technician education in a significant way.

The number of new awards that can be funded in a particular year depends on continuing commitments to awards made in prior years; the distribution of new awards among ATE Centers, for which there are few proposals and the awards are relatively large, and ATE Projects, for which there are many more proposals and the awards are smaller; and the availability of co-funding from other programs that have an interest in helping to support particular awards. With these factors in mind, in FY 2009, although we project that the program will receive more proposals—especially in response to the small-grants opportunity for institutions new to the ATE program—we also project that we can make more awards than in FY 2007. As noted previously, data for FY 2008 are estimates; proposals were reviewed on panels in late November 2007, and some award decisions have not been finalized yet. Data for FY 2009 are based on program officers' projections. It is projected that 70 percent and 60 percent, respectively, of the budget for FY 2008 and the request for FY 2009 will be available for new awards.

We expect to fund in FY 2009 approximately 40 percent of the proposals submitted to the small-grants opportunity, and many of these projects are likely to become the foundation for future, larger-scale proposals from the institutions that have developed experience through their first small NSF grant. Thus, the new small-grants opportunity may generate additional budgetary pressures in future years, as some of those grantees apply for more substantial funding to expand their initial efforts.

Cumulatively, just under 40 percent of community college systems have received NSF resources, including ATE awards over the life of the ATE program. Community colleges now educate almost half of the undergraduates in the United States and are in the pathway for 46 percent of STEM baccalaureate and master's degree graduates.

QUESTION: It appears that the amounts allocated for the ATE program in FY 2008 were consistent with NSF's budget request ($51.6 million). As you know the Committee has been supportive of budget requests for this program, but I am curious to know why amounts for ATE and Math and Science Partnerships were "protected" while explicit increases provided in the conference agreement for other education programs (e.g., Noyce) were not honored?

ANSWER: Noyce funding does increase from FY 2007 to FY 2008, and again from FY 2008 to FY 2009, though by a more modest amount than called for in the language accompanying the FY 2008 Consolidated Appropriations Act. The Noyce program is relatively new and is currently undergoing an evaluation that is expected to be completed in December 2008 to serve as the foundation for longitudinal and comparative studies of the impacts of the Noyce program investment. Until the foundational evaluation work is complete and we are able to review the results and their implications, if any, for program modifications, a substantial increase in funding for Noyce is not appropriate. As previously stated, our understanding of the ACC criterion is that both ATE and MSP have been shown to be effective as supported by appropriate rigorous evaluation.

Robert Noyce Teacher Scholarships

The COMPETES Act retools the Robert Noyce Teacher Scholarship program. The new authorization models the UTeach program, which is widely touted among academics, public officials and the private sector and has a successful track record reaching back 10 years in attracting STEM majors to K-12 STEM teaching careers.

QUESTION: Dr. Bement, the FY 2008 Consolidated Appropriations Act called for an additional $5 million for the Noyce Program. Yet, your budget documents indicate that NSF is planning on allocating only a total of $10.8 million for Noyce in FY 2008 – or $4.5 million below the level specified by Congress. Why have you (personally) chosen to disregard the Congress' directive in this regard?

ANSWER: As stated above, funding does increase from FY 2007 to FY 2008. NSF is revising its FY 2008 funding level for the Robert Noyce Teacher Scholarship (Noyce) program to be consistent with the language accompanying the FY 2008 Consolidated Appropriations Act.

QUESTION: How is this program subjected to the evaluation required under the new Academic Competitiveness Council process since the new authorization for Noyce in the COMPETES Act creates essentially a new program, revamped from the older program, now bearing little resemblance to the program that has been in place?

ANSWER: Although the reauthorization of the Robert Noyce Teacher Scholarship Program under America COMPETES adds some new elements to the program, the essential features of the program are unchanged. The goals remain the same, as does the central focus of the program to support the recruitment and preparation of future science and mathematics teachers through the award of scholarships and stipends for STEM majors and STEM professionals, with the requirement that the recipients complete two years of teaching in a high need school district for every year of scholarship or stipend support. We already require institutions receiving Noyce Scholarship grants to offer strong teacher preparation programs for the Noyce Scholars and these programs typically include the features associated with the reauthorized program such as academic courses, early field experiences, and the involvement of master K12 teachers as mentors, supervisors of clinical teaching experiences and participants in the academic aspects of the program. Noyce Scholarship grants are already required to involve collaborations between STEM faculty and education faculty. The main new features introduced under America COMPETES include the summer internships for freshmen and sophomores as well as providing the option of a three-year scholarship beginning in junior year for undergraduates who are in a five-year program. In addition, a new section authorizes the NSF Teacher Fellowships and Master Teacher Fellowships, which provides salary support for recipients while they are teaching in high need school districts, a component not previously offered under the Noyce Program.

Regardless of any changes in the Noyce program, it will still be subjected to the evaluation requirements of the Academic Competitiveness Council, as are all federally funded education programs. The ongoing Noyce Program Evaluation is designed to distinguish between different cohorts of Noyce awards and to study the impact of a variety of different models represented in the Noyce portfolio, and we expect that it will accommodate the anticipated changes that were introduced by America COMPETES.

It should be noted that the UTeach program was originally funded by NSF under an earlier teacher preparation program (Collaboratives for Excellence in Teacher Preparation) that required collaborations between STEM faculty and Education faculty and K12 teachers who worked together in redesigning teacher preparation programs. UTeach was a significant outcome of that earlier NSF investment. We are pleased that many of the features of the UTeach program are reflected in the reauthorization of the Noyce Scholarship program, but we also appreciate the flexibility that allows institutions to propose new models and strategies under the Noyce Scholarship Program.

QUESTION: The budget proposes to move Noyce Scholarships from the Curriculum, Laboratory and Instructional Development line in FY 2008 to better align with the program's purpose. Please describe this proposal in greater detail.

ANSWER: The movement of the Noyce Scholarship Program to the Workforce Development Cluster will provide a better alignment with the central goal of the program, which is essentially to develop and strengthen the STEM teacher workforce. It does not change the structure or priority associated with the Noyce Program, but provides for a more logical placement of the program within the current budget structure.

TRANSFORMATIVE RESEARCH

Dr. Bement, last year before this Committee you noted that additional resources should be allocated to transformative research and infrastructure yet no funds at NSF at the time were dedicated for this express purpose.

QUESTION: Now that a year has gone by, has the situation changed? Has the NSF developed a distinct, Foundation-wide transformative research initiative as recommended by the National Science Board?

ANSWER: NSF supports potentially transformative research throughout its many funding programs – in each research office and directorate. The President's FY 2008 Budget requested much needed support for this research. Fortunately, the President's FY 2009 Budget provides another opportunity to strengthen the Foundation's funding of potentially transformative research. An NSF-wide working group, Facilitating Transformative and Interdisciplinary Research, or FacTIR, has been established and charged with providing recommendations by the end of this calendar year on how the Foundation can further enhance its efforts to fund potentially transformative research. FacTIR has developed an operational definition of transformative research and is currently developing a plan for flexible funding mechanisms to support early stage exploratory research. By the end of this calendar year, FacTIR will present its recommendations to NSF management for the Foundation's support of transformative research. This will include new funding mechanisms, training for NSF program officers, and tracking mechanisms

Background

Transformative research is considered revolutionary as it transforms science by overthrowing entrenched paradigms and generating new ones. However, the NSB noted in its Enhancing Support of Transformative Research at the National Science Foundation that a clear definition of transformative research is needs. In the conference agreement last year, the Committee directed the NSF to review current practices supporting the solicitation of, and the support of, transformational proposals. The Foundation was directed to provide a report within 90 days to the Committee on how this emerging area can be addressed. The report is to include the Foundation's definition of transformative research.

QUESTION: What can you share with the Committee about the Foundation's assessment of the current support of transformative research within the Foundation?

ANSWER: NSF supports potentially transformative research throughout its many funding programs. It is a core part of the Foundation's mission.

As part of a 2006 survey of NSF investigators and reviewers[1], questions were asked about the community's attitudes concerning transformative research at NSF. The survey found that more than 56 percent of the respondents believed to a great or moderate extent that NSF welcomes transformative research. When asked where they would submit a transformative research idea, 45 percent of the respondents chose NSF, far exceeding the number that chose any of a variety of other potential funding sources. The majority of reviewers felt that NSF welcomed transformative proposals (>51 percent), and that they themselves had recommended transformative research proposals for funding within the past three years (>55 percent).

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[1] Impact of Proposal and Award Mechanisms (IPAMM) final report: www.nsf.gov/pubs/2007/nsf0745/nsf0745.pdf

To help ensure the Foundation's continuing support for potentially transformative research remains strong, the Foundation established in December 2007 an NSF-wide working group to provide recommendations on ways the Foundation can better support potentially transformative research. As a part of its charge, the working group was asked to develop an implementation plan for a new (an alternative to the current Small Grants for Exploratory Research) flexible funding mechanism to support early stage, potentially transformative research. Once implemented, this new funding mechanism will provide program officers with an additional tool to support potentially transformative research. In addition, effective January 5, 2008, NSF began using a revised intellectual merit review criterion that explicitly asks reviewers to assess whether a proposal includes potentially transformative concepts.

QUESTION: What is the definition of transformative research identified by the Foundation?

ANSWER: The NSB[2] defines transformative research as "research driven by ideas that have the potential to radically change our understanding of an important existing scientific or engineering concept or leading to the creation of a new paradigm or field of science or engineering. Such research also is characterized by its challenge to current understanding or its pathway to new frontiers." In order to make the NSB definition operational within the context of NSF's funding programs, the Foundation is currently using the following definition, which builds on the NSB definition, with added explanatory text and examples:

> *Transformative research involves ideas, discoveries, or tools that radically change our understanding of an important existing scientific or engineering concept of educational practice or leads to the creation of a new paradigm or field of science, engineering, or education. Such research challenges current understanding or provides pathways to new frontiers.*
>
> *Transformative research results often do not fit within established models or theories and may initially be unexpected or difficult to interpret; their transformative nature and utility might not be recognized until years later. Characteristics of transformative research are that it:*
>
> a. *Challenges conventional wisdom,*
> b. *Leads to unexpected insights that enable new techniques or methodologies, or*
> c. *Redefines the boundaries of science, engineering, or education.*

QUESTION: When will the report be transmitted to the Committee?

ANSWER: The first report was transmitted to the committee on April 18, 2008.

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[2] NSB-07-32, www.nsf.gov/nsb/documents/2007/tr_report.pdf

THE DECLINING DOLLAR
AND THE RISING COST OF COMMODITIES

Dr. Bement, if you have traveled overseas lately you know how little our dollar is worth these days. And surely, you have seen the price increases in oil as you drive your car each day or when you see your monthly heating bill. Prices of commodities of all kinds seem to be going up each day.

QUESTION: Can you give the Committee some indication to what extent these factors have affected your programs and budget at the Foundation?

ANSWER: In the Office of Polar Programs (OPP), fuel costs have increased nearly 40 percent, or $7.80 million, from FY 2007 to FY 2008. Fuel now accounts for nearly $30 million, or more than 12 percent of the infrastructure and logistics budget, including that used in generators to produce electricity and heat at our Antarctic research stations, and fuel for ship and aircraft support both in the Arctic and in Antarctica.

In the Geosciences Directorate (GEO), the largest cost increase is related to fuel for ships and aircraft. The cost of providing research ship support has risen from about $14,000 per day in FY 2005 to over $20,000 per day estimated for FY 2008, with most of this increase related to the cost of fuel.

Impacts are also being seen in the Mathematical and Physical Sciences Directorate (MPS), the primary support for many large facilities in both the operations and construction stages. While costs for fuel, electricity, water, and water processing have increased, putting strain on the operating budgets of these facilities, the devaluation of the dollar and differential inflation in countries where NSF operates facilities is also a major challenge. In Chile alone, the purchasing power of the dollar has dropped about 15 percent in the last eleven months; low exchange rates weaken NSF's purchasing power and discourage recruitment at affected facilities, which may ultimately result in a temporary slowing of scientific progress.

Background

The loss of buying power resulting from the decline of the dollar and price growth in other commodities, such as in oil and steel, may be seriously affecting many of NSF's international programs, including the Arctic and Antarctic programs; earth, ocean and atmospheric programs; and radio and optical telescope facilities operated throughout the world. For example, this year price escalations and the exchange rate increased the cost of the McMurdo break-in by as much as $1.5 million.

QUESTION: How has your budget been adjusted to reflect these cost growths and the declining buying power of the dollar or have you been forced to absorb them within your operating budget?

ANSWER: Within Polar Programs, the decreased value of the U.S. dollar against New Zealand's currency increased the Antarctica Infrastructure and Logistics Division's costs by $1.0 million last year out of the Polar Programs budget of $438.4 million, representing an increase of less than a quarter of a percent; similar increases are being seen in FY 2008. We are absorbing these increases and those for fuel within OPP's FY 2008 funding.

With regard to ship operating costs to support ocean science research, Geosciences program budgets have also largely had to absorb the increased costs.

The facilities in Mathematical and Physical Sciences, including telescopes, accelerators, and materials research facilities, have absorbed the increased costs within their operating budgets.

However, the robust budget increases included in the FY 2009 Request would address increases in commodities prices.

QUESTION: The Committee has directed you to report to us on the feasibility of establishing a currency and commodity internal reserve fund. What is the status of that analysis? Can you share with us the Foundation's recommendation on creating such an account?

ANSWER: The NSF working group tasked with studying this issue began by identifying specific cost increases and programmatic impacts associated with these currency and commodity price changes. The group then focused on ways NSF might address this challenging problem. As was anticipated by the Committee, the programs most affected are those in the Office of Polar Programs and the Directorates for the Geosciences and the Mathematical and Physical Sciences.

MAJOR RESEARCH EQUIPMENT AND FACILITIES CONSTRUCTION (MREFC)

Dr. Bement, the budget includes $147.5 million for MREFC for fiscal year 2009, a decrease of almost $75 million from last year's level or a 33 percent reduction.

QUESTION: Why such a decline when you, as an agency, are promoting increased support for major research facilities?

ANSWER: Total MREFC funding decreases by $73.2 million (33 percent) in FY 2009 and is based on the funding requirements of the projects included within the account. It is not structured to be a level-of-effort funding wedge, so sizeable changes from year to year are to be expected. Support continues for three ongoing projects (the Atacama Large Millimeter Array, the IceCube Neutrino Observatory, and the Advanced Laser Interferometer Gravitational Wave Observatory). Also included is $2.5 million for design activities for the Advanced Technology Solar Telescope. NSF's FY 2009 Budget Request for the MREFC account adheres to a multi-stage review and approval process, found in the *Large Facilities Manual*, that projects must meet to receive funding from this account. A robust budgetary framework for NSF's new project management processes, with clear go/no-go decision points, was necessary to ensure that only sufficiently mature projects are presented to the NSB, White House, and Congress for approval as full construction projects. Adhering to this process will give NSF the confidence that the technical scope for each project can be constructed within the requested budget. Three projects (the Alaska Region Research Vessel, the National Ecological Observatory Network, and the Ocean Observatories Initiative) are not slated for additional MREFC funding in FY 2009, as each is currently continuing to develop firm cost and schedule estimates. Additional MREFC funding for these projects will not be requested until they have undergone a final design review, completed a risk management plan, and developed a rigorous baseline budget, including carefully considered contingencies.

Background

The MREFC account supports the acquisition, construction and commissioning of major research facilities and equipment that provide unique capabilities at the frontiers of science and engineering. Initial planning and design of the costs of the facilities are provided in the Research and Related Activities (R&RA) account, as are follow-on O&M costs. However, the budget and a recent National Science Board report calls for the budgeting of design work within the MREFC account.

A research facility is considered "major" if its total cost of construction and/or acquisition constitutes an investment that is more than 10 percent of the annual budget of the sponsoring science directorate.

The budget deletes funding in FY 2009 for the Alaska Region Research Vessel (ARRV), the National Ecological Observatory Network (NEON) or the Ocean Observatories Initiative (OOI).

Specific projects

QUESTION: The budget includes $82.25 million for the Atacama Large Millimeter Array (ALMA), an increase of $8 million over the re-baselined profile. The budget justification indicates that this is necessary to buy down near-term risk and that increase is offset by a matching decrease in 2011. What near-term risks have increased?

ANSWER: ALMA has done a thorough analysis of the risks for construction of the facility. The additional requested money for FY 2009 will be used to accelerate the production of electronics and to begin contracts earlier in Chile. Acceleration of electronics production will decrease the risk of a potential mismatch between when antennas are delivered and when the receivers and associated electronics will be available for integration with the antennas. The costs of this acceleration of the electronics production rate was identified by the ALMA project and the 2007 annual external review as a candidate for strategic use of contingency to reduce this risk. In addition, inflation in Chile, exchange rate fluctuations, and global commodity price increases all apply budgetary pressure to future ALMA construction contracts such as those for infrastructure at the high-altitude site in Chile. The ability to use funds in FY 2009 to move forward some contracts can reduce the risk of cost growth for these materials.

Note: On May 6, 2008 there was a fatal accident at ALMA when a contractor working for NSF's European partner (the European Southern Observatory, ESO) drove off the road to the high site. Local Chilean authorities are completing their investigation. The road to the high site is presently closed. NSF and its partners are preparing an independent, broad safety review.

QUESTION: I understand that the delivery of the first antennae is already more than a year delayed. What is the status of that antenna?

ANSWER: The first antenna is now undergoing final acceptance tests. Antennas 2, 3 and 4 are in Chile, and antenna 5 is en-route. Antenna 1 experienced some minor damage during testing and the impact on the schedule is being formally assessed, but early analysis suggests a delay of two months. The main production run is believed to be on track to meet a demanding pace of one antenna every two months. The delay in completion of the first antenna had three principal causes: (a) difficulties that arise with any first-of-its-kind technology development, feedback from which is being incorporated into the production process, (b) over-optimistic (success-oriented) planning by the contractor, and (c) action by the National Radio Astronomy Observatory and the ALMA project to more clearly define the acceptance test plans. The delay in the first antenna has been largely absorbed by schedule float.

QUESTION: Given the continuing delays in the first antenna, further slippage in the production of the electronics components, and leadership vacancies, is it not likely costs will continue to increase?

ANSWER: The work performed to date for ALMA has been in overall agreement with the cost estimates as re-baselined in 2005. There is a healthy contingency for this stage in the project. The schedule is reviewed by project management on a twice-monthly basis and construction is forecast to be completed within the authorized budget (including contingency). An experienced interim Director and Project Manager are in place and effecting a smooth transition..

QUESTION: If near-term risks have risen, are we also seeing similar risks in the out-years? Are we creating a funding profile that is short in 2011?

ANSWER: ALMA is actively managing identified risks, mitigating and retiring risks where possible. New risks do of course occur, such as the supply of power to the site, and are also being actively managed. The transfer of $7.5 million from FY 2011 into FY 2009 is essentially a re-profiling of contingency and is not expected to result in any FY 2011 shortfall.

QUESTION: What did the 2007 annual external review of ALMA determine and recommend?

ANSWER: The annual external review in September 2007 concluded that there has been impressive progress on-site, comprehensive management practices are firmly in place, there is ongoing and effective risk assessment and mitigation, and that the cost of the project appears to be well understood and tracked and with an adequate amount of contingency.

The review panel expressed their concerns principally in two areas: (i) schedule slips in the delivery of the first antennas and electronics units, and (ii) the slow rate of staff build-up, especially in support of system integration and verification. The panel recommended that the project look for opportunities for strategic use of contingency and other means to head off schedule conflicts and that it adopt a change in recruitment philosophy from milestone-driven to one of aggressive strategic hiring.

In response, the project has conducted a detailed examination of the supply chain and production status through internal meetings and workshops and is planning an upcoming critical review. Purchase of additional test sets and recruitment of extra assembly and test staff have been initiated. Approximately half of the necessary systems engineering support staff have been recruited, in line with revised requirements given the delivery dates of antennas and electronics, with most of the remainder to be hired over the next six months.

QUESTION: Four new starts were proposed in the FY 2008 budget, but it looks like only one – Advanced LIGO – continues to receive continued funding in FY 2009. Are there design problems, schedule or cost overruns with the other new starts which appeared in the FY 2008 budget – namely AARV, NEON, and OOI?

ANSWER: ARRV, NEON, and OOI do not yet have robust designs, risk-adjusted cost estimates, and construction schedules that can be used to request appropriations for construction. NSF instituted a new preconstruction planning process in December 2005 that establishes a sequence of progressively detailed review activities that are synchronized with the budget development process. These three projects were introduced into the MREFC budget before this process was established. In order for NSF to have confidence that the proposed technical scope for each project can be constructed within the requested budget, we have directed each project to continue developing a construction-ready plan, budget, and schedule. When each project says they are ready for NSF to scrutinize what they have done, we will conduct a Final Design Review of each project, using a broad panel with expertise, technical and management, to advise us on the soundness of the planning, before requesting an MREFC appropriation.

QUESTION: Can NEON and OOI use the MREFC funds allocated to them in FY 2008 to support design activities? If so, how given the Foundation's request for implementing appropriations language in FY 2009?

ANSWER: Design activities for NEON and OOI are being supported only through the R&RA appropriation.

QUESTION: With respect to ARRV, what is the return to date on NSF's investment of $50 million?

ANSWER: To date $51.43 million has been appropriated for construction of the ARRV. Of that amount, $2.58 million has been awarded for activities associated with updating the ship design (originally completed in 2004) to comply with current health, safety and environmental regulations, and construction codes, and to develop final construction plans. The residual funds will remain available until needed to support construction activities.

QUESTION: The budget justifications indicate that "NSF is implementing a 'no cost overrun' policy, which requires that cost estimates developed at the preliminary design stage have adequate contingency to cover all foreseeable risks, and that cost increases not covered by contingency be accommodated by reductions in scope." What is the status of the implementation of this policy? When – and how -- will it be fully implemented?

ANSWER: NSF is implementing this policy now. Risk assessment and alternative analysis is an integral part of each stage of project planning and review. Project proponents must develop, insofar as practical, robust planning and risk-adjusted cost estimates for the scope they propose to accomplish. This will allow NSF to have greater confidence in its budget requests.

NSF conducts external reviews of large projects at each phase - Conceptual Design, Preliminary Design, and Final Design - utilizing experts in all of the major technical, management, and administrative areas that the project must utilize to accomplish its proposed scope. The review panel is charged to advise NSF on the completeness of the planning and the thoroughness of the risk assessment, so that through a combination of budget contingency, scope contingency, and schedule contingency the project will be able to achieve their overall objectives and construct the proposed facility within the requested budget.

QUESTION: The budget justifications indicate that all projects in the MREFC account are undergoing or have undergone major cost and schedule reviews. For each of the projects contained in the account for FYs 2007, 2008 and FY 2009, please provide the dates of the last review, the final determined cost and schedule, and annual funding requirements.

ANSWER:

Project	Date of Last Review	Type of Review	Final Cost, Schedule & annual funding requirements
AdvLIGO	Nov 07	Final Design Review	TPC $204.7M; 7 years Fiscal Year 08 ($32.75) 09 ($51.43) 10 ($46.30) 11 ($15.21) 12 ($23.73) 13 ($15.50) 14 ($19.78) 15 ($0.42)
ARRV	Feb 08	Design Review	2 cost estimates were provided. Cost will not be known until they finish the design in Spring 2008
ALMA	Jan 06	Rebaselined	US TPC $499.26M; 10 years

			Fiscal Year Prior 07 ($190.97) 07 ($64.30) 08 ($102.07) 09 ($ 82.25) 10 ($42.76) 11 ($13.91) 12 ($3.00)
IceCube	May 07 Has annual reviews on cost and management	Operations Review	US TPC $242.07M; 8years Fiscal Year Prior '07 ($178.77) 07 ($24.39) 08 ($22.38) 09 ($11.33) 10 ($5.20) Operations began 2007 ($1.25) ramping up to 2014 ($4.60)
NEON	May 2007	Preliminary Design Review	FY 2009 Final Design Review will establish formal baseline.
OOI	Dec 2007	Preliminary Design Review	Q1 FY 2009 Final Design Review will establish formal baseline.
South Pole Station	2007	NSF internal review of remaining scope	TPC $149.29; 11 years Fiscal Year Prior '07 ($133.47) 07 ($6.19) 08 ($6.55) 09 ($3.08)
ATST	Nov 06	Preliminary Design Review	Critical design review planned for mid-2008 and baseline review in Spring 2009. Environmental and native population issues under active discussion.

QUESTION: I note that the FY 2008 Facility Plan discusses only those projects under construction and those new starts in FYs 2007, 2008 and initial funding 2009; it excludes "horizon projects" this year unlike previous years. Why is that, as surely there must be projects in NSF's current view of facility opportunities?

ANSWER: In previous years, the inclusion of Horizon Projects within the *Facility Plan* has created some confusion that the mention of particular projects is an endorsement by NSF that it intends to construct and operate these facilities. This is not the case. The list of Horizon projects is intended to be only a list, as far out as NSF can see, of potential new science opportunities that may motivate the construction or acquisition of new major research infrastructure. For any of these projects to be realized, they must be of high priority within the affected research community, have high priority within the range of disciplines supported by the sponsoring NSF directorate, and of high priority to NSF and the Nation, as determined by the NSF Director and the National Science Board. The sequence of design reviews that is part of NSF's preconstruction assessment process must ascertain that the project planning is robust, and that the projected operating costs are both credible and affordable.

QUESTION: What climate change projects are on the horizon?

ANSWER: Some horizon projects, if constructed, may contribute to research on the effects of climate change. For example, one potential horizon project would investigate human-stressed water systems, an area of investigation with obvious possible couplings to climate-change research. Researchers involved with that particular project are currently developing their science objectives, defining and prioritizing what science questions they are trying to answer. Once those goals are established, the specific tie-ins to climate change will be more apparent.

Change in policy regarding funding design costs within the construction account:

QUESTION: The National Science Board just released a report that calls for a change in policy to your Construction Account to allow for design work to be done from the MRFEC account. Coupled with the legislative authority in your request, it seems that the Foundation has already adopted this recommendation in its funding request. Would that be accurate?

ANSWER: The National Science Board and NSF are actively discussing in what circumstances MREFC funds might be used for design, and how such a policy would be implemented. This consideration is prompted by the recognition that the substantial sums necessary to plan future major research infrastructure can potentially distort the funding available to support researchers in a particular field.

The issue is complex: requirements for preconstruction planning, while substantial, are small in comparison to those needed to operate a facility, and so we want to make sure there is "appetite control," a feedback mechanism that proposes future candidates for construction funding at a rate that is within NSF's capability to support their operation.

QUESTION: The budget includes $2.5 million for "initial support" for the design of the Advanced Technology Star Telescope (ATST). If funding for this activity were denied in this account given the legislative changes required, would NSF undertake this activity with the appropriate science directorate? What other program adjustments would be made in that directorate to pay for the ATST's initial design costs?

ANSWER: The project requires the $2.5 million in FY 2009 to continue final design activities and environmental studies, and to maintain the core project team. If Congress denies this funding within the MREFC account and does not provide it within the R&RA account, these project costs will have to be borne by reductions (below the request level) in other parts of the Division of Astronomical Sciences or the current project will be considered for postponement or termination.

QUESTION: Excluding construction costs, what additional costs or funding requirements other than "initial support" are known at this time?

ANSWER:
There are three additional anticipated major sources of cost:

1. Assuming an eight-year construction profile, early operations will begin in year six, and operations costs will ramp to a steady state of approximately $20 million per year at the end of construction.
2. Approximately 40-50 percent of the ATST operations costs will be offset by the closure or divestment of existing NSO assets that will be made redundant by ATST. The costs associated with these activities and the re-location of the NSO headquarters are currently unknown.
3. Since Haleakala has historic and cultural significance, the impact of ATST must be mitigated pursuant to Section 106 of the National Historic Preservation Act. The cost of this mitigation is unknown at this time, although consultation with native Hawaiian stakeholders is ongoing.

QUESTION: If we are to allow research and design moves to the Construction account, then why have the account at all?

ANSWER: The fundamental purpose of the MREFC account is to avoid distorting base program funding when the Foundation commits to major facility projects. This purpose would remain valid even if design activities are funded through MREFC.

QUESTION: What is the role of the Foundation in prioritization of the MREFC account, and what is the Board's?

ANSWER: After a project has completed a successful Preliminary Design Review (PDR), the Assistant Director (AD) or Head of the sponsoring organization asserts that the project has high scientific merit and is of high priority; the project is then presented to the MREFC Panel for review. The MREFC Panel (chaired by the NSF Deputy Director with the ADs, program office heads, and with the advice and recommendation of the Deputy Director of the Large Facility Office and the NSF Chief Financial Officer) forwards one or more projects in priority order to the NSF Director, who then decides what to forward to the National Science Board (NSB) for approval to include in a future year budget request. If NSB approves the project for future year funding, it specifies its priority among all projects in the Board-approved stage. The highest priority projects endorsed by the NSB are projects currently under construction. For inclusion in a Budget Request as a "new start", the NSF Director proposes, in priority order, the NSB-approved construction-ready projects for the MREFC account

QUESTION: Should the NSB become formally engaged in review and approving priority order and actual funding of all post "initial proposal stages" for MREFC projects as they have recommended in the report?

ANSWER: NSF concurs with the NSB recommendation that NSB be formally involved in prioritizing projects at an early stage of development. The specific implementation details will require more study, but the report raises some good issues, and there is ongoing dialogue between NSF and NSB to work these out.

EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCoR)

Dr. Bement, as you know, the Congress has long supported the EPSCoR program, providing a total of $115 million in FY 2008, an increase of $8 million over the request. Yet, it appears from looking at the budget justifications, that NSF plans to allocate only $111.1 million for the program, almost $4 million less than provided by this Committee.

QUESTION: What happened to the rest? Why have you chosen to disregard Congressional direction in this regard?

ANSWER: In the FY 2008 Current Plan, funding within the Research and Related Activities Account increases by 1.1 percent over the FY 2007 Current Plan. As directed, funding for EPSCoR will total $115 million, an increase of almost 13 percent over the FY 2007 Plan.

Background

The EPSCoR program seeks to stimulate sustainable improvements in the R&D capacity and competitiveness with the major research universities in certain states. Currently 25 states and Puerto Rico and the Virgin Islands participate in the program. In FY 2008, the Consolidated Appropriations Act provided $115 million for EPSCoR, an increase of $8 million over the request. Within the increase, the Congress directed that not less than $4 million be allocated to research infrastructure improvements (RII) and at least $1 million be made available for co-funding.

QUESTION: The budget documents indicate that program growth for EPSCoR is to increase by 2 percent in FY 2009. If Congressional direction were adhered to, however, the increase would actually be a decrease of over 1 percent. Why is the NSF playing loose with the numbers for EPSCoR?

ANSWER: The FY 2009 Request of $113.5 million reflects anticipated funding required for RII, co-funding, and outreach activities. With the level in the FY 2009 Request, EPSCoR will invest in approximately eight RII Track 1 and up to four RII Track 2 awards, will co-fund about 275 awards with NSF directorates and offices, and will support regional workshop and other outreach activities.

QUESTION: Why propose cuts to a proven and successful program when the NSF's overall budget is growing by nearly 14 percent?

ANSWER: From FY 1997 to FY 2009, EPSCoR's budget has tripled (198 percent growth) while the overall NSF budget has approximately doubled (108 percent growth). Over the same period of time, the average annual growth rate of the EPSCoR budget has been approximately 10 percent (9.89 percent) compared to approximately 6 percent (6.12 percent) for NSF overall. The funding level requested in FY 2009 is adequate to accomplish the goals of the program.

QUESTION: The EPSCoR 2020 report suggested that RII awards be increased from 3 year/$3 million a year awards to 5 year/$5 million awards, that there be increases in co-funding and that there be new cyber-infrastructure efforts. We supported those efforts and also mentioned the possibility of Small Grants for Exploratory Research (SGERS), traineeships, regional innovation awards, special networking programs. What are your current plans for allocating the FY 2008 funds? Please be specific by program.

ANSWER: Beginning in FY 2008 the duration of RII awards will increase to a maximum of five years. The maximum annual funding level is being maintained at the current $3 million per year, or $15 million over five years. The new award duration provides time for sustained implementation and assessment. Critical to the success of the RII activity is a clear investment strategy that is aligned with the jurisdiction's S&T plan. An important component of this effort is the role and involvement of state committees in setting a vision for science and technology in the jurisdiction and a well conceived strategic plan that aligns EPSCoR activities with state or jurisdiction planning.

In FY 2008, EPSCoR plans to co-fund approximately 275 awards with NSF directorates and offices and to allocate $1.3 million for outreach.

NSF EPSCoR Investment
(Dollars in Millions)

	FY 2008 Current Plan
RII	$71.0
Co-funding	42.7
Outreach	1.3
Total	$115.0

Beginning in FY 2008 and continuing in FY 2009, EPSCoR is partnering with the Office of Cyberinfrastructure (OCI) to address cyberinfrastructure needs in EPSCoR jurisdictions. In FY 2009, the RII activity is being expanded to include awards to consortia of EPSCoR jurisdictions to support innovation-enabling cyberinfrastructure. These RII Track 2 awards will provide up to $2 million for up to 36 months for these purposes. These awards will also enhance discovery and learning, will respond to Section 7020 of the America COMPETES Act, and will expand the scientific literacy of all citizens.

NSF is reexamining the Small Grants for Exploratory Research (SGER) program and is considering various options. We anticipate EPSCoR jurisdictions will take full advantage of the opportunities presented. EPSCoR jurisdictions are also strongly encouraged to participate in Integrative Graduate Education and Research Training (IGERT) and other traineeship activities.

QUESTION: How would these program allocations change if you were to have adhered to the directives contained in the Consolidated Appropriations Act?

ANSWER: With additional funds, EPSCoR would place a stronger emphasis on co-funding with the NSF directorates and offices.

QUESTION: In your FY 2009 request of $113.5 million, you have created a two-tier Research Infrastructure Improvement (RII) grant structure with what looks like the old RIIs in Track 1 and a regional version in Track 2. Please explain this change in RIIs and how the $76 million requested would be allocated between the 2 Tracks.

ANSWER: RII Track 1 awards will continue to support physical and human infrastructure improvements in EPSCoR jurisdictions. RII Track 2 awards will support consortia of EPSCoR jurisdictions to develop innovation-enabling cyberinfrastructure that focuses on common geography, common scientific themes, or common computational platforms. It is anticipated that approximately $70 million will be invested in RII Track 1 activities and approximately $6 million in RII Track 2 activities.

QUESTION: What is your timeframe for these two programs?

ANSWER: EPSCoR plans to release two solicitations. Solicitations for the RII Track 1 and Track 2 will each be released in the summer of 2008. Track 1 proposals will be due in the fall of 2008 and Track 2 proposals will be due four to six weeks thereafter.

QUESTION: As you know, West Virginia has a very strong state EPScoR committee that has been vital to the success of the program in the state. As you also know, you don't create a research infrastructure overnight or from a string of grants. You have to have focus, over-arching equipment, often clusters of researchers and multidisciplinary teams, This takes commitment from many different sources at the institution, state and federal levels. Could you talk about the importance of the role of the state committees and what you would like to see these committees do in the future, especially in view of the COMPETES Act and increasing cyber-infrastructure investments?

ANSWER: Strong state committees have direct access to the governor's office, state legislatures, national leaders, and the business community.

Effective EPSCoR committees can implement a strategic plan, align goals and activities of the strategic plan with state science and technology objectives, and ensure consistency with NSF strategic goals, as appropriate.

The role of committees is to ensure that EPSCoR project leadership is current in the selected research focus areas, dedicated to broadening participation in STEM, and committed to the development of a globally engaged workforce.

QUESTION: Besides EPSCoR, what other NSF efforts are underway to ensure geographical balance in awards being made by all programs, including efforts such as cyber-infrastructure?

ANSWER: Consistent with the organic act and the 2006-2011 strategic plan, NSF strives to avoid undue concentration of funding. NSF supports several targeted programs to facilitate the participation of traditional underserved populations and will continue to do so in response to the America COMPETES Act Section 7020.

QUESTION: The America COMPETES Act of last year asked NSF for a report on cyber-infrastructure needs in EPSCoR states and a plan for meeting those needs. What is the status of this report and what are future plans?

ANSWER: In response to Section 7020, the EPSCoR Office in collaboration with the Office of Cyberinfrastructure is planning a needs assessment of broadband access for academic research in EPSCoR jurisdictions, for minority serving institutions, and in rural areas. The target release date for this report is fall 2008. The findings from this report will serve as input for future implementation plans.

QUESTION: Currently, half the states are EPSCoR states. Several have been added in the past few years. One speculation is that as NSF tends to make large, interdisciplinary awards, more and more states will fall below the EPSCoR criteria line. Does this mean that the trend is for NSF funding to become even more skewed toward a few states and institutions?

ANSWER: NSF's commitment to individual investigators remains. Co-funding opens doors to programs across NSF for individual investigators and collaborations in EPSCoR jurisdictions. Co-funding enables the EPSCoR program to collaboratively support cutting-edge research and education projects that have competed successfully through the merit review process within NSF programs and initiatives but would not otherwise be supported because of limited resources.

QUESTION: There is growing concern among the EPSCoR states that two trends are working against them. One is that an increasingly number of NSF solicitations either directly or implicitly require cyber-infrastructure that these states do not have. Another is that solicitations increasingly require large interdisciplinary teams of researchers that EPSCoR institutions may not have. How can EPSCoR states better compete in this environment and what can NSF do to help?

ANSWER: Beginning in FY 2008 and continuing in FY 2009, EPSCoR is partnering with the Office of Cyberinfrastructure to address cyberinfrastructure needs in EPSCoR jurisdictions. The RII activity is being expanded in FY 2009 to include awards to consortia of EPSCoR jurisdictions to support innovation-enabling cyberinfrastructure. These RII Track 2 awards will provide up to $2 million for up to 36 months for these purposes. These awards will also enhance discovery and learning, will respond to Section 7020 of the America COMPETES Act, and will expand the scientific literacy of all citizens.

QUESTION: I know that NSF has tried to expand participation of EPSCoR state researchers on boards, advisory committees and peer review committees. Can you provide some figures with respect to participation from EPSCoR states?

ANSWER: The overall percentage of participants on NSF committees from EPSCoR jurisdictions in FY 2007 was approximately 15 percent.

Participation on NSF Committees and Panels
By Members from EPSCoR and Non-EPSCoR Jurisdictions - FY 2007

Type	EPSCOR	Other
Advisory committee	31	208
Subcommittee	3	51
Committees of Visitors	28	228
Panel	1909	10510
Site visit	102	673

QUESTION: One of the recommendations of the EPSCoR 2020 Report was that the EPSCoR program be moved to the Office of Integrative Affairs (OIA) in order to better

integrate EPSCoR efforts into the research directorates and priorities. The Committee supported this move. How is this move working to accomplish your goals?

ANSWER: As a result of EPSCoR's move to OIA, there is a sharper focus on research and a heightened visibility of EPSCoR across NSF. To facilitate enhanced interaction across the Foundation, the EPSCoR Science and Engineering Group has been formed with NSF-wide representation. In partnership with the EPSCoR Office, this group shapes NSF's vision for EPSCoR and assists in the implementation of that vision.

ICEBREAKING

Dr. Bement, over the last several years at each of your appearances before the Committee we have addressed the issue of replacing the aging fleet of icebreakers.

QUESTION: We have talked a lot about it, but tell me, has anything of real substance been done this past year?

ANSWER: Congressional appropriations to NSF for FYs 2006 – 2008 have enabled investments in maintenance and system recapitalization for the USCG's *Healy* that, if sustained, will ensure her availability to support NSF-funded research for the next 15-20 years. The appropriations have also funded work on the USCG's *Polar Sea* and for training her crew such that this ship stands ready to provide backup assistance, if needed, for resupply of U.S. Antarctic Program research stations. However, NSF plans to use the Swedish icebreaker *Oden*, pursuant to the U.S.-Sweden Science & Technology Agreement, as the primary Antarctic resupply icebreaker, with the Polar Sea on standby in event the Oden is unable to complete the break-in. NSF will also continue the forefront U.S.-Sweden research collaboration aboard *Oden* in the Southern Ocean.

Background

The U.S. has both national and strategic interests in the Arctic and Antarctic. Repeated high-level policy reviews have affirmed the importance of the U.S. presence in the Polar regions. Currently, the only two icebreakers built to handle heavy ice – the Polar Sea and the Polar Star – are near the end of the service lives for which they were designed. Both have experienced mechanical problems that required extensive repair. This year, NSF's budget deletes funding necessary to keep the Polar Star in caretaker status, reflecting the agency's determination of no current or future need for the vessel. Currently, NSF contracts with a Swedish icebreaker, Oden, which also serves as a research platform.

QUESTION: From your perspective, has the Administration initiated any long-range planning for Polar Icebreaking?

ANSWER: The National Academy of Sciences study, "*Polar Icebreakers in a Changing World, An Assessment of U.S. Needs*", funded by the Coast Guard, has focused attention on this issue and has been the subject of a number of discussions among Coast Guard, NSF, and White House staff. Our focus has been on ways to meet NSF requirements for scientific research over the next 4-8 years.

QUESTION: Has the Administration even given you a sense of whether Polar Icebreaking capabilities are considered a national priority, or even needed at all?

ANSWER: The Administration has provided strong support for arrangements that have enabled NSF to meet its continued need for polar icebreaking capabilities in support of scientific research programs.

QUESTION: Do we have a national need for ice-breaking capabilities independent of the need to support scientific research in the Polar regions?

ANSWER: Other federal agencies are more qualified than NSF to address needs beyond those required to support scientific research.

QUESTION: The FY 2009 budget includes $54 million for the polar icebreaking fleet, but I understand that the Coast Guard's estimate may be higher than that given the maintenance that is to be conducted in FY 2008 and the effect of operation of the vessels during this year. What is the current estimate of costs for polar icebreaking in FY 2009 and why was that estimate not included in the budget request?

ANSWER: The FY 2009 budget request is based on an estimate provided by USCG during budget preparation.

QUESTION: The budget also includes an additional $9 million for back-up icebreakers. Does this represent the increase over previous contracting services to offset the loss of services of the Polar Star?

ANSWER: This is the estimated reimbursement to Sweden for use of the *Oden* in FY 2009 (charter and fuel), and is over and above the costs estimated for Coast Guard reimbursements. The cost covers both a research expedition in the Southern Ocean and opening the channel to McMurdo Station. With prudence (and USCG recommendations) dictating having two icebreakers available for the McMurdo resupply and the cost of bringing *Polar Star* back into service being prohibitive, the only option for maintaining the U.S. Antarctic Program is to fund work on *Polar Sea* to keep that ship operational and available for work in the Arctic and for backup assistance in the Antarctic and to fund *Oden* operations. The *Oden* costs are provided from the Office of Polar Programs' programmatic funds and not from the USCG Icebreaker line.

QUESTION: I understand that NSF has contracted with a marine services firm to conduct a verification and validation study of the Coast Guard's engineering and maintenance plans. When is that study to be completed and what do you expect to learn from that study?

ANSWER: The initial phase of the study is complete; a report is expected in late spring. The purpose of the study was to validate the USCG's maintenance and system recapitalization program. The results will be used to inform current budget decisions and future budget requests.

US ANTARCTIC PROGRAM CONTRACT

Dr. Bement, the NSF OIG's semiannual reports describe a series of audits of the NSF Antarctic Program's contract with Raytheon. These audits questioned $56 million of costs for the first five years of the contract and identified a number of internal control weaknesses at Raytheon.

QUESTION: What steps is NSF taking to resolve the issues raised by these audits?

ANSWER: NSF has been actively pursuing resolution of the issues identified in the audit reports with Raytheon with the participation of other U.S. Government agencies with oversight responsibilities. Questioned cost issues breakdown into four categories:

- "Local" overhead expenses charged as direct expenses to NSF's contract contrary to Cost Accounting Standard (CAS) 418 -- $21.3 million

  This issue has been resolved. On September 17, 2007, the Defense Contract Management Agency (DCMA), the cognizant reviewer of Cost Accounting Standards (CAS) administration for the Raytheon business unit with whom NSF has contracted, withdrew its prior determinations that Raytheon was not in compliance with CAS 418. Since the expenses were correctly billed as direct costs in the performance of the NSF contract, NSF allowed the questioned costs in their entirety and closed this audit issue on February 19, 2008.

- Corporate expenses charged as direct expenses to NSF's contract contrary to CAS 418 -- $14.9 million

  NSF cannot comment while NSF's Inspector General is addressing this issue with Raytheon.

- Direct costs questioned due to reasons of allowability, allocability or reasonableness -- $7.5 million

  NSF is working with Raytheon to resolve this matter. Raytheon submitted a comprehensive collection of source documentation, and it appears to NSF that Raytheon has substantiated the questioned costs to a significant degree. Final resolution of this issue is anticipated shortly.

- Indirect costs questioned in excess of limitations set forth in NSF's contract -- $12.2 million

  All parties agree that resolving the questioned indirect costs must be preceded by resolving the first three matters which concern direct costs. By first determining the direct cost base and then the attributable indirect costs, it will be possible to determine the indirect cost rate and then determine if the contract limitation for such has been exceeded.

The internal control weaknesses identified can be characterized under two headings:

- Cost data is not reconciled between tools used for performance measurement and the company's cost accounting records, nor is it recorded in a consistent manner.

Raytheon submitted an internal assessment of its reconciliation process and a draft Cost Accounting Standards Board Disclosure Statement for the Polar Services business unit to NSF. NSF reviewed the internal assessment but considers the document to be incomplete and is therefore planning to conduct its own review of Raytheon practices to determine whether corrective actions are needed. The review is tentatively planned for June 2008.

Regarding the cost recording issue, Raytheon revised its draft Disclosure Statement and resubmitted it in February 2007 to DCMA. Additional audit review must now be done by the NSF Inspector General and the Defense Contract Audit Agency (DCAA).

- Subcontract management can be improved through an annual review of contractor billing accuracy based upon a risk assessment.

  Raytheon is in the process of completing a risk analysis and incurred cost review for its South American port agent, and is assessing its subcontracting policies and procedures. The results will be presented to NSF. Furthermore, to validate the results of the assessment, NSF will conduct its own Contactor Purchasing System Review and require particular corrective actions, if needed. NSF is working with DCAA and DCMA to schedule this review.

Background

Most of the questioned costs ($36.2 million) resulted from Raytheon's failure to comply with its disclosed accounting practices for charging indirect costs. The audits also raise issues about the way NSF has managed its single largest contract, indicating that changes need to be made in the terms of future U.S. Antarctic program contracts to avoid such problems. The next Antarctic program contract is expected to cost in excess of $1 billion over the next 10 years.

QUESTION: How will NSF ensure that the next Antarctic Program contractor complies with its federal Disclosure Statement, as required by federal regulations? Will the next contract include specific provisions for NSF to assess the contractor's compliance with its Disclosure Statement?

ANSWER: The Request for Proposal (RFP) will require offerors to provide disclosure statements. Furthermore, NSF will attain pre-award audit support services from DCAA to review the disclosure statements to verify that potential contract awardees are currently in compliance with Federal Cost Accounting Standards.

The next contract will have specific provisions pertaining to contractor compliance with their stated Disclosure Statement. Based on lessons learned and contracting best practices, the resultant RFP will include language designed to emphasize the requirement for full compliance with Federal Cost Accounting Standards and the subsequent penalties that will be incurred if noncompliance becomes an issue.

QUESTION: Will the next contract provide for penalties and award incentive fees contingent on the contractor's compliance with the administrative, business and financial terms of the contract?

ANSWER: Yes. In addition to including appropriate Federal Acquisition Regulation (FAR) clauses in the contract which will incentivize and/or penalize the contractor's performance, NSF is currently closely scrutinizing a variety of incentive methodologies to achieve optimal results for the desired administrative, business, and financial terms of the contract. Lessons learned and best practices are being compiled to provide feedback and guidance in drafting appropriate RFP language to address this subject. Extensive market research is also being conducted consisting of industry one-on-ones, meetings with other government agencies and subject matter experts to gather information which will be useful in drafting responsive language in the contract. NSF is committed to ensuring that appropriate surveillance plan(s) will be included in the contract and qualified NSF staff will be committed to monitor the contractor's performance. NSF's objective is to provide assurance that the contractor's efforts are appropriately monitored and evaluated in accordance with the terms and conditions of the contract.

NEW INITIATIVES

Dr. Bement, your budget includes several new initiatives totaling $45 million. These include:

- **Science and Engineering Beyond Moore's Law - $20 million**
- **Adaptive Systems Technology - $15 million**
- **Dynamics of Water Processes in the Environment - $15 million**

QUESTION: Would you describe each of these initiatives for the Committee?

ANSWER:
Science and Engineering Beyond Moore's Law: NSF's investment in Science and Engineering Beyond Moore's Law (SEBML) is designed to take computing power and communications *beyond* the physical and conceptual limits of Moore's Law. Increasing power and communications will require entirely new scientific, engineering, and conceptual frameworks. Fundamental research across many disciplines will lead to the new hardware, architectures, algorithms, and software needed to address challenges such as efficient input and output, data storage and internal communications, and reduction of energy dissipation, as well as sheer computing power. SEBML is a multidisciplinary research effort with strong ties to economic competitiveness and potential for transformation. Tied to both nanotechnology and cyberinfrastructure, it builds on past NSF investments in nanoscale science and engineering, as well as communications and computational technologies.

Adaptive Systems Technology: In a knowledge-based economy, improved couplings at the human-machine interface can revolutionize human productivity and workforce development. The Adaptive Systems Technology (AST) effort is intended to generate creative pathways and natural interfaces between human and physical systems that will revolutionize the development of novel anticipatory and adaptive systems. AST is important to advances in highly-innovative adaptive control systems, hybrid computer architectures, improved electronic PDAs, and computer-based, self-paced, learning and training tools.

Dynamics of Water Processes in the Environment: An abundance of water at and near the surface sets Earth apart from the other planets of our solar system. Water creates landforms, transports essential nutrients throughout the biosphere, and is intimately involved in weather patterns and climate. This effort is focused on increasing fundamental understanding of the complex processes and feedbacks that affect the vulnerability and resilience of freshwater systems to environmental change, as well as the impacts of human interventions on them. Improved models will provide the scientific basis for decision-making about water resources, including mitigation and adaptation strategies. The results will lead to better forecasting of changes in rainfall, surface and ground water, and ocean circulation associated with global warming.

Background

Science and Engineering Beyond Moore's Law – Moore's Law is an empirical observation made in 1965 that computer processing power doubles every 18 months. It is anticipated that with current silicon technology, both the physical and conceptual limits of Moore's law will be reached in 10 to 20 years.

Adaptive Systems Technology – This research is to spur advances in highly-innovative adaptive control systems, hybrid computer architectures, improved electric PDAs, and computer-based learning tools. This initiative was pushed by the Deputy Director.

Dynamics of Water Processes in the Environment – This science aims to increase understanding of the Earth's freshwater systems, including the effect of global warming on such systems.

QUESTION: With respect to each of these initiatives, could you please explain how they differ from what NSF is already funding? What is the value added of these new programs?

ANSWER: Science and Engineering Beyond Moore's Law: The research that will be conducted under Science and Engineering Beyond Moore's Law will build on previous research in nanotechnology and cyberinfrastructure. NSF leadership in these areas has helped to create communities ready to take on the challenges of SEBML. The new aspects of SEBML include the search for drastically new and different frameworks, algorithms, and software. The strong SEBML investment will let NSF focus on promising technologies like optical and photonic systems, molecular-based approaches including biologically inspired systems, and the exploitation of quantum interactions.

Adaptive Systems Technology: NSF currently funds research within several science and engineering disciplines that focuses on the study of networks, in nervous systems, in communications systems, and computing technologies. However, no program currently integrates research in these related areas of science and engineering in a broad, interdisciplinary effort. New applications, technologies, and products resulting from the convergence of neuro and physical systems have already demonstrated economic potential in areas such as adaptive control systems, leaning and assist systems, and prosthetics. AST will create a dynamic environment to education and inspire the next generation of scientists and engineers.

Dynamics of Water Processes in the Environment: NSF supports a wide range of fundamental research related to water, such as work on aquatic ecosystems, water cycle processes, and water management engineering. This proposed program would take advantage of this background, but differs in its highly interdisciplinary character and focus on understanding the complex and dynamic interactions among various parts of the environment affected by or dominated by water. Example questions to be explored are: How will a specific ecosystem be affected by changes in precipitation & runoff associated with climate and land use change? What are the instream-streamflow requirements for fish and other aquatic organisms under these hydrologic and land use changes? How can data and data management tools be designed to produce high quality predictive models of aquifer levels, watershed-scale water budgets? What new engineering principles are needed to adapt to abrupt changes in water quantity and quality? In short, the value of the research is to be able to understand environmental occurrences that are closer to the complex realities of the "real world" and to lessen the unanticipated consequences of human interventions.

QUESTION: For each of these initiatives, what do you anticipate the future funding requirements to be?

ANSWER: Future funding needs have not yet been determined.

QUESTION: Would that additional funding be included in future budgets or would support be taken from existing programs and activities?

ANSWER: Future budget requests will be largely dependent upon the evaluation of their initial success. Success will be gauged by the response of the scientific community, the kinds and quality of proposals received by NSF, and feedback from the external peer reviewers of those proposals.

QUESTION: Are any of these initiatives to receive support from other federal agencies?

ANSWER:
Science and Engineering Beyond Moore's Law: Not yet, but strong potential exists for interagency partnering with organizations such as Department of Defense, NASA, NIST, and the intelligence community.

Adaptive Systems Technology: NSF does not currently intend the Adaptive Systems Technology program to receive support from other federal agencies.

Dynamics of Water Processes in the Environment: Presently this request is limited to NSF, but we are optimistic about forming effective partnerships with other federal agencies. Preliminary discussions with USGS indicate that there could be considerable synergy with their data collection and the projected expansion of the U. S. Water Census. During the planning year, we will explore specific areas of partnership with other agencies, including EPA, NASA, and NOAA.

QUESTION: With respect to Science and Engineering Beyond Moore's Law, what types of partnerships do you see developing, if any, with national laboratories and the private sector?

ANSWER: MPS supported centers and facilities have developed extensive partnerships with industry and National Laboratories across many disciplines, including the nanoscale science and engineering arena, and these are likely to be extended in the SEBML-related fields. As a specific example, the semiconductor industry partners with NSF in providing supplementary student support for NSF centers and institutes in the area of fundamental long range research in nanoscale science and engineering. The Foundation will consider a comparable program for SEBML.

QUESTION: With respect to Adaptive Systems Technology, how was it determined that this field of science warranted a special $15 million initiative?

ANSWER: Any new effort requires a concerted funding effort. Investment decisions are made through negotiations and the input of the various NSF stakeholders, including the scientific community, Congress, and the National Science Board.

The AST program was designed as an interdisciplinary program involving collaboration among several scientific disciplines and engineering based on diverse input from the scientific community. Adaptive Systems Technology emerged as a priority for NSF investment following three neuroscience workshops and a NSF-sponsored symposium that demonstrated the scientific community's excitement in this emerging area of research.

This investment is worthwhile considering the great promise of the AST program for scientific discovery, technical innovation, greater economic competitiveness, and its potential to provide training and build interest in the Science and Engineering workforce.

CLIMATE CHANGE SCIENCE PROGRAM

Dr. Bement, the FY 2009 budget for NSF includes nearly $221 million for the Climate Change Science Program. This level is an increase of 7 percent over last year's level.

QUESTION: What new areas of research, observation or modeling are expected to be undertaken in FY 2009 with these funds, and why, in particular, were these activities selected?

ANSWER: The new efforts that NSF will undertake in FY 2009 align with the interagency priorities for the Climate Change Science Program (CCSP) and were chosen for that reason. These include new efforts in (1) Quantification of Climate Forcing and Feedbacks by Aerosols, Non-CO_2 Greenhouse Gases, Water Vapor, and Clouds; (2) Assessing Abrupt Climate Change in a Warming Climate; (3) Development of an Integrated Earth System Analysis Capability; (4) Development of an End-to-End Hydrologic Projection and Application Capability; (5) Enhanced Carbon Cycle Research on High Latitude Systems; and (6) Ecological Forecasting. These priorities arose in response to the findings from the Intergovernmental Panel on Climate Change (IPCC) and other assessment activities and are intended to provide the scientific basis and tools needed to meet stakeholder needs for information on regional to global scales.

Background

The Climate Change Science Program (CCSP) was established in 2002 to provide science-based knowledge to predict change, manage risk and take advantage of opportunities resulting from climate change and climate variability. It also looks at understanding how the interplay between natural factors and human activities affect the climate system. The CCSP involves 13 U.S. agencies in a concerted interagency program of basic research, comprehensive observations and integrative modeling. Four agencies – DOE, NASA, NOAA and NSF – receive about 90 percent of the funds. The bulk of NSF's work takes place in the Geosciences ($164.7 million).

While most of NSF's climate change program elements remain flat, two components are slated for significant increases:

- **Geosciences: +$7 million or 4% increase**
- **Office of Polar Programs: +$7.8 million or 74 percent increase**

QUESTION: Given the emerging importance of climate change research, I was surprised to see funds for the climate change science program within NSF actually declined from FY 2007 to 2008, albeit marginally (-1%). I would have anticipated more marked growth, not a reduction. What contributed to declining levels of NSF investment in climate change research in FY 2008?

ANSWER: NSF's level of support for specific research activities, including those associated with the CCSP, depends to a very large degree on the number of meritorious proposals received from researchers across the Nation in an area. The small change from 2007 to 2008 (-$1.38 million) reflects the receipt of more particularly meritorious proposals in FY 2007 involving work complementary to CCSP than in previous years. These additional supported projects in 2007 resulted in an increase in CCSP support above the original 2007 planned level. The apparent decline from 2007 to 2008 reflects an anticipated return to what has been the historical level of support for programs related to CCSP.

QUESTION: Significant increases (+74 percent) for climate change research are planned within the Office of Polar Programs. Could you please elaborate on these activities?

ANSWER: The increase is associated with International Polar Year activities: $7.02 million to accelerate climate change research and the associated observing and modeling systems, with increased emphasis on human impacts; and $0.78 million for studies of climate variability and change in the Arctic. These numbers include the increased cost of logistics and infrastructure needed to support the research.

QUESTION: Where in the science directorates, in your opinion, would further investments in research related to climate change make the most sense in FY 2009? Why?

ANSWER: NSF invests in climate change research through the GEO, OPP, BIO, and SBE directorates. Our FY 2009 Request addresses the critical need to advance modeling capabilities in order to better capture the dynamic coupling of the various components of the earth system, such as coupling land surface models and/or ecological system models with hydrologic models, or understanding the links between land use and change and drought frequency and models that can capture the coupling of the climate and carbon cycle processes, especially in regions where sensitivities are high such as the polar and boreal regions. Indeed, detailed documentation of the rapid changes in polar regions can be captured as part of International Polar Year activities. Moreover, regional concerns about the potential for changes in the potential for local drought frequency will require far greater understanding of processes at local levels which requires both higher resolution observations and much higher resolution models that are able to capture the salient processes that are now inadequately represented in global models.

QUESTION: The budget includes $17 million for oceans research in FY 2009, an increase of $12 million over FY 2008. How is this research complementing climate change research activities?

ANSWER: GEO activities under the Ocean Research Priorities Plan (ORPP) will be focused on the four near-term priorities: 1) monitoring and modeling studies of the Atlantic Meridional Overturning Circulation and its role in abrupt climate change; 2) the response of coastal ecosystems to inundation driven by persistent forcing and extreme events; 3) the development of chemical and biological sensors for observing the response of ecosystems to climate change and other environmental pressures; and 4) the comparative analysis of marine ecosystem organization, which is sensitive to chemical and thermal changes that may be influenced by climate change. Of particular interest are the biological and chemical consequences of ocean acidification, which is a direct result of carbon emissions.

QUESTION: What agencies are participating in the oceans research program and how much are they contributing?

ANSWER: For FY 2009, the total requested amount in all participating agencies is $40 million, which includes funding for NASA in addition to USGS, NOAA, and NSF. In FY 2008, the Department of the Interior (USGS), NOAA, and NSF appropriations for ORPP activities collectively totaled $11.25 million.

QUESTION: What do you anticipate the additional funding for the ocean research program in the out-years to be, for the NSF and the other participating agencies?

ANSWER: Future budget projections are difficult to make, but sustained investment in the ORPP by the agencies can be expected.

QUESTION: Some of the data generated by climate change research is stored in online archives, but much remains in a less accessible format. As a result, some researchers are concerned about the availability of the data. A recent GAO study determined that NSF, among other Federal agencies, cannot determine the extent to which researchers are making data available to others nor does it monitor whether researchers make that data available. What is the NSF doing in response to the GAO's findings?

ANSWER: The GAO report made three specific recommendations to NSF which are paraphrased below:

1. Develop mechanisms for systematic notification that data have been submitted to archives.

For many of NSF's research activities, there is an entity responsible for overseeing data quality control and archiving, with the vast majority of climate data sets falling into this category. The scientific communities using data sets are regularly appraised at scientific meetings of the availability of new data sets. We believe this long-standing practice of periodic notification is more effective than individual notification as each new data set is archived.

2. Use the review process, where their program offices are not currently doing so, by (1) evaluating researchers' data sharing plans as part of the grant review process and (2) using evidence of researchers' past data sharing practices to make future award decisions.

As noted in the GAO report, many program offices in NSF are already evaluating data sharing plans and weighing past data sharing in making award decisions. Programs and directorates have publicized their data policies on their web sites, and review panels consider data sharing as part of the merit review process.

3. Evaluate whether additional strategies are warranted to facilitate the permanent archiving of relevant data, which may include leveraging existing resources, devoting a great portion of data collection funds to archiving activities, or working with existing entities such as the NSTC's IWG on Digital Data, to develop additional archives.

NSF seeks to leverage existing data storage resources by cooperating with partner agencies to archive research data, and has expanded the capabilities at existing data archiving centers as required. At this time we do not believe new strategies for permanent data storage are needed for NSF-supported projects.

A large portion of the data collected routinely that is relevant to the CCSP is obtained by various mission agencies (NOAA – NODC and NCDC, USGS, USDA, NASA, etc.) which also host national archives. Much of the data collected as part of NSF's research efforts is ultimately stored in such archives. For example, much of the paleoclimate data is stored in the World Data Center for Paleoclimatology run by NOAA in Boulder, CO, although some resides in the National Lacustrine Core Repository at the University of Minnesota. Data from process studies may be stored at agency archives or at facilities serving the broader community such as the

National Center for Atmospheric Research (NCAR). In addition, data are stored in personal archives maintained by NSF Principal Investigators at their home institutions.

QUESTION: Is the NSF evaluating data-sharing plans when considering grant proposals? If not, why?

ANSWER: Data-sharing plans are an important consideration during both the peer review of proposals and subsequently in the award decision process. The NSF has a standing agency-wide data policy requiring free (other than duplication costs) and open access to data collected with NSF support. Most directorates have more detailed guidelines and terms designed specifically for the types of data normally collected in the research disciplines they support and may include specific requirements as part of their formal proposal solicitations.

QUESTION: What activities does the NSF have underway to facilitate permanent storage of relevant data?

ANSWER: NSF has a wide range of activities underway to meet data storage requirements. A prime example resides at NCAR where the model results for IPCC runs are archived along with numerous field program data sets required by CCSP scientists in the earth, ocean, as well as atmospheric sciences. The total archive at NCAR is about 4 Petabytes, with many terabytes of curated observational data sets (some dating back to the late 1800s). The archive is backed up at a separate facility. As noted previously, NSF encourages or requires some data to be stored in archives maintained by other agencies such as the National Snow and Ice Data Center and alerts researchers to this requirement by so specifying in its solicitations. NSF supports the archive at a number of academic centers such as the National Lacustrine Core Repository at the University of Minnesota (paleoclimate data); Columbia University that houses Antarctic data and serves as a portal to the U.S. Antarctic Master Directory and NASA's Global Change Master Directory and which also provides tools for access and manipulation of that data; and the Climate Variability and Predictability and Carbon Hydrographic Data Office at University of California San Diego (with many comprehensive ocean data sets). The Long Term Ecological Research (LTER) websites provide access to the long-term ecological data sets.

QUESTIONS FOR THE RECORD

LABOR –EFFORT REPORTING

Recent OIG audits of the systems used by universities to report labor effort on NSF awards found problems with tracking the time that faculty voluntarily contribute to the awards. Without proper accounting and reporting, NSF cannot determine whether the faculty actually devoted the time they committed to in their grant proposals. Moreover, some university systems fail to track and report voluntary effort that was committed to, resulting in higher indirect-cost rates being charged to NSF awards. Audits have also found that universities do not always understand the types of activities NSF allows faculty to perform when given an award for summer salaries.

QUESTION: How does NSF inform universities of the federal regulations for accounting for voluntary effort and ensure university compliance with these regulations?

ANSWER: The Foundation informs the university community of regulations for voluntary effort, a form of cost share, across a variety of venues. It provides policy and procedural guidance related to time and effort reporting and cost share in its *Proposal and Award Policies and Procedures Guide*, available electronically at www.nsf.gov/publications/pub_summjsp?ods_key=papp. This is, in turn, supplemented by guidance and sample templates for use by the university community on NSF's webpage at www.nsf.gov/bfa/dias/caar/time.jsp and related guidance for cost share on its webpage at www.nsf.gov/bfa/dias/caar/costrev.jsp. In addition, with issuance of each award and award increment, NSF provides awardees with a link to *Grant General Conditions (GC-1)* that outlines requirements for cost sharing and reporting.

The Foundation advises universities to comply with the specific guidance provided by Office of Management and Budget (OMB). The NSF webpage provides a link to Cost Principles for Educational Institutions, OMB Circular A-21 (Revised May 10, 2004) at www.nsf.gov/bfa/dias/caar/fed.jsp. Specifically, related to the topic of voluntary effort, OMB issued Clarification of OMB A-21 Treatment of Voluntary Uncommitted Cost Sharing and Tuition Remission Costs (January 5, 2001), which can be found at www.whitehouse.gov/omb/memoranda/m01-06.html. With respect to the setting of indirect cost rates, NSF advises universities that indirect cost rate methodology must be negotiated and approved by their appropriate cognizant federal agency. Rate negotiations with colleges and universities are typically handled by the Department of Health and Human Services (DHHS), Department of Defense (DoD), or the U.S. Department of Education (DoED); NSF does not negotiate rates with any colleges or universities.

The Foundation has incorporated these topics into NSF's regular outreach activities, including but not limited to, the NSF Regional Grants Conferences, Society of Research Administrators (SRA) Conferences, National Council of University Research Administrators (NCURA) Conferences, Council on Governmental Relations (COGR) Conferences, and Federal Demonstration Partnership (FDP) Conferences.

Foundation efforts to ensure university compliance with Federal and Agency regulations related to time-and-effort reporting and cost sharing are primarily achieved through various components of NSF's post award administration which includes the Award Monitoring and Business Assistance Program (AMBAP).

For large research institutions, this assurance would be obtained through various vehicles which include AMBAP site visits and/or desk reviews. For smaller institutions or those new to NSF funding, without established or posted indirect cost rates, NSF will generally conduct a pre-award review of the institution's time-and-effort report templates and documented policies and procedures as part of an assessment of the institution's overall accounting system. In addition, these institutions are further monitored through review and follow-up, as required, to external institutional audits required annually under OMB Circular A-133 (see www.whitehouse.gov/omb/circulars/a133/a133.html) and OIG audits that address the time-and-effort compliance. When problems are identified, NSF management resolves findings with the institution and coordinates resolution efforts with the appropriate cognizant audit agency.

QUESTION: Has NSF defined the types of activities that a faculty member is allowed to perform when charging 100 percent of his/her salary to an NSF award during two summer months? Specifically, can summer salary awards cover costs for performing peer reviews for federal awarding agencies, carrying out committee work, and writing grant proposals for another competitive award?

ANSWER: The Foundation is in the process of reviewing existing policies related to inclusion of summer salary on proposals submitted to NSF. A draft revision to the policy has been developed and is awaiting review by senior NSF management.

In response to the question related to specific types of activities (i.e., performing peer reviews, committee work, writing grant proposals) allowed for summer effort, NSF's position is that these activities are generally recovered through the indirect rate and therefore should not be charged directly to any award regardless of when the effort was performed. All costs must be directly attributable to the award, allowable, and reasonable. Relevant guidance can also be found in OMB Circular A-21, referenced above. Methodology for charging costs to federal awards must be consistent with the organization's *Cost Accounting Standards Board Disclosure Statement-2 (DS-2) for Educational Institutions* for treatment of direct, indirect, and unallowable costs.

ACCOUNTING FOR PROPERTY, PLANT AND EQUIPMENT

The independent audit of NSF's FY 2007 financial statements identified a significant weakness in NSF's system for accounting for $550 million of property, plant and equipment owned by NSF, mostly related to its Antarctic Program operations.

QUESTION: How will NSF address the auditor's recommendation either to develop an agency-wide property management system that includes the Antarctic program or to require the next Antarctic Program contractor to provide a property accounting system that integrates into an overall property management system to be developed or purchased by NSF?

ANSWER: The development of a Property Plant & Equipment (PP&E) system has broad implications that NSF needs to consider carefully, to maintain the integrity of its systems and program mission. The potential impact ranges from changes in contract procedures, to the use of significant resources for assessing the cost/benefit of such a proposed expansion. The Foundation also needs to consider how consistent these efforts would be in relation to its compliance with Federal Acquisition Regulations.

NSF plans to use its A-123 "Management's Responsibility for Internal Control" Program to conduct an initial review of PP&E cost documentation to help NSF determine if additional valuation efforts are needed. In addition, NSF will identify and document internal controls related to the U.S. Antarctic Program (USAP) PP&E systems. Based on the results of this initial process, NSF can better determine further actions that should be taken on the existing PP&E systems.

The Foundation will continue to validate and verify the PP&E associated with USAP. These actions were incorporated into NSF's audit Corrective Action Plan (CAP) for FY 2008. NSF will continue to work in partnership with the Office of Inspector General in the implementation of the CAP, to improve its operations.

RESPONSIBLE CONDUCT OF RESEARCH (RESPONSIBLE PROFESSIONAL PRACTICES)

Section 7009 of the America COMPETES Act requires that the Director "require each institution that applies for financial assistance from the Foundation for science and engineering research or education describe in its grant proposal a plan to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduate students, graduate students, and postdoctoral researchers participating in the proposed research project."

QUESTION: What specific requirements on grantee institutions has NSF already implemented?

ANSWER: NSF views the Congressional directive as an important opportunity to further engage with the research community on the important issue of responsible research conduct. Ethics education is particularly critical to the science and engineering community as it faces an increasingly competitive funding environment; rising collaboration with international colleagues who may follow different guidelines; and growing recognition of the relevance of science and engineering to social, economic, and ethical issues of wide public and political interest.

Since the enactment of the America COMPETES Act, NSF has been actively engaged in developing appropriate implementation strategies for section 7009. Specific plans include the addition of a new certification requirement to be provided by the Authorized Organizational Representative (AOR) at the time of proposal submission. The AOR certification would stipulate that the institution has a plan to provide appropriate training and oversight in responsible and ethical conduct to researchers participating in the NSF-funded projects.

QUESTION: What internal tracking and oversight mechanisms has NSF implemented to ensure that grantees are adhering to its requirements?

ANSWER: NSF's Office of the General Counsel has already developed and implemented sanctions for researchers found to have violated the Foundation's misconduct regulation.

NSF staff are currently developing internal tracking and oversight mechanisms to ensure grantees are adhering to the requirements of section 7009. We will keep the Committee informed throughout this process.

QUESTION: What steps has NSF taken to alert grantee institutions to its new requirements?

ANSWER: NSF has conducted significant outreach to the research community on the responsible conduct of research requirement through groups such as the Council on Governmental Relations and the Federal Demonstration Partnership.

NSF will implement a range of activities to alert grantee institutions to this new requirement, as well as to provide quality resources to assist them. For example:

- In summer 2008, the Ethics Education in Science and Engineering (EESE) program will sponsor a workshop to address RCR and responsible professional practices. The goals of this workshop are to: (1) identify best practices and gaps in existing knowledge; (2) discuss potential benefits of on-line resources; and (3) identify quality materials and resources for the community.

- The Foundation's merit review criteria, *Intellectual Merit* and *Broader Impacts,* raise levels of awareness to essential characteristics of successful proposals to both reviewers and prospective Principal Investigators. To highlight the importance of ethics and responsible conduct of research, NSF plans to revise the Broader Impacts Representative Activities document to specifically identify training in the responsible and ethical conduct of research.

NSF is committed to completing its draft implementation plan and soliciting comment from the grantee community via the Federal Register. The request for comment will not only provide the community with a sense of the direction that the Foundation plans to take in implementing RCR, but also provide institutions with an important opportunity to prepare their own institutional implementation plans; re-allocate resources as appropriate; make any necessary enhancement to information systems; and the like. The Foundation believes that this thoughtful approach will improve the quality of the institution's implementation, as well as, to the extent possible, enable the scientific community to consider the financial impacts that these requirements will have on institutions, and to minimize such impacts accordingly.

QUESTION: Does NSF require additional resources to ensure that grantees are providing appropriate training to ensure responsible professional practices by succeeding generations of researchers?

ANSWER: The FY 2009 Request includes sufficient resources for NSF to ensure that grantee institutions are aware of this Congressional requirement. Once grantee institutions establish their own plans and implement appropriate RCR training, we anticipate that the Office of Inspector General will audit and monitor institutional compliance with individual training plans and requirements in the same manner that OIG currently oversees a grantee institution's compliance with NSF's investigator financial disclosure policy.

NSF fully intends to leverage results obtained in over a decade of funding leading-edge research on ethics education through its cross-directorate programs. These programs include Ethics Education in Science and Engineering program (see www.nsf.gov/funding/pgm_summ.jsp?pims_id=13338&org=NSF&sel_org=NSF&from=fund); the Integrative Graduate Education and Research Traineeship program (see www.nsf.gov/funding/pgm_summ.jsp?pims_id=12759); and Research Experience for Undergraduates Sites (see www.nsf.gov/funding/pgm_summ.jsp?pims_id=5517&from=fund).
In addition, many major research centers recently funded by NSF have embedded the analysis of social and ethical issues into their core research programs and include training for students at all levels. Examples of this embedded ethics research can be found in NSF funded centers on nanotechnology (see www.umass.edu/sts/nano/, cns.asu.edu/) and synthetic biology (www.synberc.org/humanpractices.html).

CONFLICT OF INTEREST

The Department of Health and Human Services' Office of Inspector General recently issues a critical report reviewing NIH's procedures and oversight of grantee conflicts of interest reports. This report raised serious questions about NIH's processes and the accuracy and completeness of grantee reporting. NSF implemented conflict of interest regulations similar to NIH's and requires that institutions certify on submitted proposals that the institutions will report to it conflicts that it cannot manage, reduce or eliminate.

QUESTION: Since 1996, when NSF's policy was implemented, annually, how many such conflicts have been reported to NSF?

ANSWER: NSF's Investigator Financial Disclosure Policy imposes upon grantee institutions the primary responsibility for collecting and reviewing financial disclosures and responding to actual or potential conflicts. The institutional policy must meet several minimum requirements, including arrangements for keeping NSF appropriately informed if the institution finds that it is unable to satisfactorily manage an actual or potential conflict of interest. For approximately the past ten years, NSF's electronic proposal submission system (FastLane) has provided an electronic mechanism under the "Research Administrator Notifications" tab for grantee institutions to inform NSF of any investigator financial interest that cannot be managed under the university's existing financial disclosure policy.

The FastLane information is sent directly to the General Counsel's Office. To date, NSF has not received any information regarding "unmanageable" investigator financial interests.

QUESTION: What types of conflicts have been reported, and what is your assessment of the adequacy and completeness of the reports received?

ANSWER: Grantee institutions have, on occasion, informally contacted the General Counsel's office for advice regarding managing particular investigator financial interests. As stated above, however, there have been no reports of unmanageable investigator financial interests.

It is important to note that the types of investigator financial interests reviewed by NSF may be significantly different than those that may concern HHS. NSF's mission is to promote advances in science and engineering research and education. To accomplish our mission, we fund a significant amount of the federal government's investment in basic research. NSF does not fund biomedical or clinical research, and we fund a very small percent of low risk human participant research. The areas of concern for the human participant research we fund can be very different from that associated with biomedical or clinical research. For example, surveys or questionnaires that we fund may raise confidentiality or privacy issues, whereas other human participant research may impact the social or cultural lives of an indigenous community. Basic research in some cases may result in inventions. Some inventors may create start-up companies to license the technology. These technologies do not have life or death consequences. Most of the investigator financial interests that our awardees are required to manage do not have life or death consequences. NSF believes that the current procedures adequately address the needs of our community. In 2004, an internal assessment of our current policy was conducted by the General Counsel's office. This issue was discussed with NSF staff, NSF management, and IG staff. The results of this assessment revealed:

1. There have been very few instances of investigators not disclosing potential financial interests to their institutions pursuant to their institution's policy.

2. There have been very few instances of smaller institutions (e.g., community colleges) not having an Investigator Financial Disclosure Policy in place. Policies were subsequently implemented.
3. There were no reported instances of an investigators' financial interest not being properly managed by the institution.

QUESTION: What is NSF's process for receiving, evaluating, and resolving the issues raised by these reports?

ANSWER: As previously stated, NSF has had an electronic mechanism under the "Research Administrator Notifications" tab of FastLane for grantees to inform NSF of any investigator financial interest that cannot be managed. If we were to receive such information any time in the future, we would immediately contact the awardee to ascertain the facts and assist with developing an appropriate way to manage, reduce, or eliminate the financial interest.

QUESTION: Do you consider the reporting rate to accurately reflect the true rate of unresolved conflicts addressed by grantees?

ANSWER: Yes. It is highly unlikely that there are many unresolved investigator financial interests that cannot be managed in light of the basic research that NSF funds, especially in view of policies that may contain a waiver mechanism that appropriately balances conflicts and risk. For example, if the grantee makes a determination that imposing conditions or restrictions would be either ineffective or inequitable, and that the negative impact of the financial interest is outweighed by interests in scientific progress, technology transfer, or the public health and welfare, the conflict (actual or appearance-wise) may be waived and the research may proceed. NIH does not have such a waiver process because of the high risk nature of the research that they fund.

SOCIAL, BEHAVIORAL AND ECONOMIC SCIENCES

QUESTION: A major current effort for SBE is the studying the Science of Science and Innovation Policy (SciSIP). How is that going and what does SBE expect to accomplish with your FY 2009 funds and are they adequate?

ANSWER: In the FY 2009 Request, SciSIP funding increases by $6.14 million bringing the total to $16.91 million. This increase will allow SBE to invest an additional $3.12 million in the Science of Science and Innovation Policy (SciSIP) research solicitation as well as provide for $3.02 million for the Division of Science Resource Statistics' (SRS) redesigned survey pilot. SciSIP solicitation funding will support research with an emphasis on global and comparative understanding of the dynamics of science and technology, as well as topics resulting from three workshops held in FY 2008. An increase in SRS funding will enable implementation of a full-scale pilot test of the Business Research and Development Survey, develop pilot data on postdocs, and support analytical activities relating to data extraction to better inform and enhance the success of SciSIP. The remaining core resources, totaling $10.77 million, will support the development of the factors necessary to build an evidence based platform for science and innovation policy, namely: tools, data, and data management. A key component will also be to build virtual organizations and other collaborative efforts that allow researchers across geographical and disciplinary spaces to collaborate across research platforms. This not only leverages data, instrumentation, and computational resources but also broadens graduate-student expertise.

In FY 2008, NSF anticipates making approximately 15 to 20 SciSIP awards, totaling approximately $7.97 million. The FY 2008 solicitation deadline was March 18, 2008 and the three emphasis areas are: analytical tools, model building, and data development and augmentation. This solicitation also encourages proposals on collaboratories or virtual organizations that further research on the evidence-based platform for science policy. SRS will continue survey redesigns that support SciSIP objectives, totaling approximately $2.8 million. Additionally, three workshops will be held in summer of 2008. The topics are: developing a research infrastructure to study the businesses that are critical components of economic competitiveness; the scientific validity of visualization tools that enable policy makers to understand the dynamics of innovation; and developing scientific models to facilitate industry/university partnerships in the NSF context.

In FY 2007, SciSIP funded a total of 19 awards (totaling nearly $6.7 million) grouped into four themes: human capital development and the collaborative enterprise, returns to international knowledge flow, creativity and innovation, knowledge production systems and science policy implications. Additionally, Science Resources Statistics (SRS) activities pertaining to SciSIP totaled approximately $2.5 million, bringing the total to $9.2 million. These funds allowed SRS to redesign data collections to better reflect how science is conducted in the 21st century and to contribute to design and development of new science and technology indicators.

QUESTION: The Human and Social Dynamics priority area has come to an end in FY 2008. Can you tell us what the supported research has achieved in providing answers to important scientific and policy questions?

ANSWER: Since FY 2004, the Human and Social Dynamics (HSD) Priority Area has been funding interdisciplinary approaches to understanding the dynamics of human action and development, as well as organizational, cultural, and societal adaptation to change. As of FY 2007, the HSD program had funded over 300 full research and exploratory awards, including several Small Grants for Exploratory Research (SGERs) for research in the aftermath of natural disasters.

HSD has been successful in bringing together novel, interdisciplinary teams to address complex questions, such as the dynamics of change in interactive systems, managing profound or rapid change, and making decisions in the face of uncertainty. Several research themes have emerged from the four years of the HSD competition, which have promise for answering scientific questions of national importance. Specific topics of study with relevance to policy decisions include environmental change, sustainability, approaches to problems involving complex interactive systems, globalization, migration, and dynamics of social networks. For example, one project created a model for predicting future emerging disease outbreaks, while another studied the factors influencing individual vaccination decisions. Both of these have obvious implications for policy decisions.

In addition, HSD has created an extensive infrastructure of data that will be useful for studying future societal questions. Specifically, HSD has funded IPUMS-International, the Integrated Public Use Microdata Series, to preserve and harmonize global census microdata from over 80 censuses, for 26 countries, and over 200 million individuals. This infrastructure project is now the largest public-use population database in the world, with over 2,500 researchers already registered to use the database. HSD projects have also studied the factors that promote innovation and mediate the interaction between basic research results and marketable technologies, which are important for enhancing the US competitive edge and aligned with the American Competitiveness Initiative.

With the conclusion of HSD, SBE plans to redirect its resources to core programs to support emerging HSD themes. Currently, the plan is to focus on three of these emerging areas: the interactions between humans and environmental systems, work on complexity and systems thinking, and developing infrastructure.

QUESTION: What is the role of the SBE directorate in the new NSF priority areas: Cyber-enabled Discovery and Innovation (CDI); Adaptive Systems Technology (AST); and Dynamics of Water Processes in the Environment?

ANSWER: The CDI investment promotes the advancement of science and engineering along fundamentally new pathways opened by computational thinking. CDI includes three themes for FY 2009, all of which are central to SBE priorities: 1) From Data to Knowledge, 2) Understanding Complexity in Natural, Built and Social Systems, and 3) Virtual Organizations. SBE's role will focus on work relevant to complexity and systems models of human thoughts and behavior, social organizations, institutions, and processes. The CDI approaches promise to transform analysis and understanding by reconceptualizing fundamental behaviors and process and by revealing the emergent properties of dynamic systems. In addition, virtual organizations are new modes for organizing scientific and other work. As such, they are ideally suited as a subject for SBE research.

In relation to the NSF's AST investment, SBE's role will advance the understanding about the interplay among physical systems, brains, and human cognition, with research focused on developing new collaborations, approaches, and imaging techniques to discover the brain mechanisms involved in the cognitive functions of language, perception, memory, and emotion.

Although SBE is not directly participating in the NSF-wide investment "Dynamics of Water Processes in the Environment," it funds research that investigates the human dimensions of environmental phenomena, such as water supply, climate change, and effects of drought, hurricanes, and tsunamis.

QUESTION: NSF has supported three major surveys: the Panel Study of Income Dynamics (PSID); the General Social Survey (GSS); and the American National Election Study (ANES) for many years. What have we learned from these surveys and what can we expect to learn from them in the future? Are there other important data collections that SBE could support with more resources?

ANSWER: Each of the three major surveys is attuned to a different facet of the social world; together they provide a complementary understanding of the social organization and dynamics of the United States.

The American National Election Studies, begun in 1948, provide a foundation of evidence for the scientific understanding of electoral behavior that helps the Nation nurture and refine its system of government. Analyses of ANES data have shown that citizens' political judgments are motivated by conceptions of the common good that transcend personal interests, and that trust in government is shaped by evaluations of its performance.

The General Social Survey, launched in 1972, is an ongoing series of representative samples of the U.S. adult population that track patterns of change in the social organization, values, and perceptions of the Nation. The GSS has measured dramatic shifts over decades in personal trust, confidence in social institutions, neighborhood safety, racial tolerance, women's participation in government, and support for scientific research. GSS data have been used in scientific studies of social capital, social isolation, and generational change in attitudes.

The Panel Study of Income Dynamics, initiated in 1968 with a national sample of 5,000 families who have been interviewed periodically for decades, focuses on changes in income and wealth during the life course and across generations. Data from the PSID have illuminated the dynamic nature of poverty: "the poor" are not a stable and closed class; instead, many families are poor for short intervals, only a few families are poor for long intervals. Analyses of PSID data also have shown stark differences in social mobility between white and black children of similar social origins, and research using data from the PSID and GSS has shown how wealth, family, and race interact in subtle ways to shape the life chances of children. In 2005, the principal investigator of this research, Dr. Dalton Conley of New York University, was awarded the Alan T. Waterman prize, NSF's highest honor for scientific achievement.

Four aspects of the surveys will produce significantly original results in the near future. First, extending the time series of measurement in each of the three surveys will reveal new aspects of change in U.S. society. For example, PSID data now extend to the grown offspring of families in the initial wave of the study, which affords analysts unprecedented insight into the influence of social origins and family structure on the life chances of adults. Second, both the ANES and GSS have added panel data that provide significantly increased precision of measurement and insight into the dynamics of change to their cross-sectional samples. Third, the surveys now record the geographic locations of respondents, which allow them to examine responses within their social contexts, the neighborhoods and communities that shape residents' lives and outlook. New analytic tools have been developed for the systematic analysis of such multi-level data, and initial studies have produced new patterns of explanation. Finally, the surveys are beginning to measure biological and behavioral characteristics of respondents, which extend the scale and scope of behavioral and social science to link finegrained measures of individuals to large-scale patterns of social organization, perhaps using ideas from complexity theory as the bridge.

QUESTION: NSF's support for the National Consortium on Violence Research (NCOVR) will come to an end this year after 11 years. What have we learned about violence from this NSF-supported virtual center?

ANSWER: The National Consortium on Violence Research (NCOVR, www.ncovr.heinz.cmu.edu) has taught us much about the origins and dynamics of violent behavior and has produced three methodological innovations that have broad applicability in the behavioral and social sciences. NCOVR research has shown that violent behavior has its origins in the earliest years of family life: trajectories of high-risk behavior begin by age 6 and may continue through the life course. Maternal circumstances, chiefly teenage motherhood and low levels of education, are the strongest predictors of violent behavior in children and the best points for intervention.

BIOLOGICAL SCIENCES

The budget includes $3.10 million for the creation of the Center for Research at the Interface of the Mathematical and Biological Sciences (CIMBS).

QUESTION: Please provide the annual funding requirements for the center, the contributions of the other participating federal agencies by year.

ANSWER: The new Center for Research at the Interface of the Mathematical and Biological Sciences (CIMBS) is expected to operate at a funding level of $3.3 M per year from NSF contributions (the BIO directorate will contribute $3.1million and the Mathematics and Physical Sciences directorate will contribute $0.2 million). The Department of Homeland Security is expected to contribute an additional $1 million each year towards the center beginning in FY 2009.

QUESTION: The justifications indicate that the Center was deferred from FY 2008. Why, at that time, was the Center deferred?

ANSWER: Full funding for CIMBS was included in the FY 2008 Budget Request to Congress. Because the request was not fully funded, some activities had to be deferred until FY 2009. Dependent on final reviews, site visits, and availability of funds, we are anticipating that reduced start-up support for the Center may be possible by the end of the fiscal year with full funding at $2.5 million for the first full year of operation in FY 2009.

QUESTION: What is the imperative that such a center be initiated then in FY 2009?

ANSWER: NSF recognizes the need and urgency for research at the boundary between the mathematical sciences and the life sciences. Mathematical modeling and computational simulations have become critical to leading edge biology by advancing our understanding of non-linear systems such as invasive species dynamics and gene regulation. This Center will play a critical role in building closer ties between the disciplines of biology and mathematics, to foster next-generation advances in each field. CIMBS will serve the needs of the mathematical and biological communities by providing mechanisms to foster synthetic, collaborative, cross-disciplinary studies. Furthermore, the Center will play a critical role in addressing national needs, particularly in the area of modeling infectious diseases of animals and plants, and will provide knowledge that will be useful to policy makers, government agencies, and society.

QUESTION: The budget includes $6 million for project design and development costs for the National Ecological Observatory Network (NEON). What are these funds for? Why are they not budgeted in the Construction account?

ANSWER: The NEON, Inc. Project Office is currently completing the final NEON Project Execution Plan (PEP), addressing site selection and deployment issues, and beginning work on Environmental Compliance. They are finalizing the network design and addressing issues raised at the Preliminary Design Review (PDR) in May 2007. A follow-up review of outstanding issues identified during the PDR will be held later in 2008. In FY 2009 the final design and baseline, scope, schedule, and the risk-adjusted cost will be reviewed. Funding for the project design and development comes from the Research and Related Activities (R&RA) account. In accordance with NSF policy, construction and funding from the NSF MREFC account can only begin following a successful Final Design Review.

BROADENING PARTICIPATION

Programs broadening participation in the research accounts grow by less than one percent. In the education account, they fare slightly better, but still trail the overall growth in that account by nearly half.

QUESTION: Why are these activities growing so much more slowly than other parts of NSF? Is this still a priority?

ANSWER: The National Science Foundation is committed to broadening participation in science, technology, engineering, and mathematics (STEM) disciplines. One of our core values is to be broadly inclusive, reaching out especially to groups that have been underrepresented in the sciences and engineering. Our Strategic Plan highlights our intentions to prepare a diverse, globally engaged STEM workforce and to build capacity while integrating research with education. This year NSF is working on developing a plan to increase the participation of underrepresented groups throughout NSF programs.

At the same time NSF has been strengthening programs designed specifically to broaden the participation of underrepresented groups. Programs such as the Centers for Research Excellence in Science and Technology, ADVANCE, the Louis Stokes Alliances for Minority Participation, and the Historically Black Colleges and Universities Undergraduate Program have grown at a higher rate than NSF as a whole since 2001. Several other EHR-based programs have increased at a proportionally higher rate than the overall EHR account during this same time frame. Alliances for Graduate Education and the Professoriate, the Tribal Colleges and Universities Program, and the Advanced Technology Education programs are examples.

Broadening Participation is also integrated throughout NSF programs. 31.3 percent of NSF's total investment is made by the R&RA directorates and offices, and it is also a required focus area in many NSF cooperate agreements and the "other impacts" criteria for merit review.

PHASE OUT OF NSF'S NATIONAL SCIENCE DIGITAL LIBRARY PROGRAM

The FY 2009 budget renames the $16.5 million National Science Digital Library program the National Science Distributed Learning program – same acronym – different name (see p. EHR-6 of the NSF Justifications.) We understand that NSF intends to end its support for the operational component of existing National Science Digital Library in FY 2008. NSF has invested over $50 million over the years to support research and to develop this on line resource for science educators. It seems that NSDL is exactly the kind of cyberinfrastructure initiative envisioned in your own strategic plan as well as the Administration's own American Competitive Initiative.

QUESTION: Why is NSF terminating support for this system so abruptly?

ANSWER: The NSF is continuing its support of this cyberinfrastructure initiative. Support of the collections amassed by the NSDL will increase by $250,000 in FY 2009, as noted in the FY 2009 Budget Request. The change in the name of the NSDL program signals a shift in focus from archiving teaching materials to taking a proactive role in helping teachers and students connect with those materials. It also signals an increased emphasis on assessment of the usefulness of the archived materials for enhancing learning.

QUESTION: Was there some formal evaluation that warrants such an abrupt action?

ANSWER: Support for NSDL is undiminished, as noted above. During FY 2008, we are shifting the model of support for central services away from one in which core technical services for the NSDL collection, responsibility for initiating associated partnerships, and a variety of leadership and management activities, have all been undertaken within a single large cooperative agreement. In some years, this single award has been supported by as much as a third of the program's annual resources. Going forward, we anticipate supporting the technical services and the leadership activities in separate grants or agreements. NSF has experience with each of these approaches in its other centers and major programs. The less centralized model will permit focused attention on each of the following efforts in this time of rapid change within the underlying disciplines: 1) maintaining technical competence, and 2) supporting an effective social network that promotes use of the materials.

Overall, the NSDL program is undergoing an evaluation within the normal cycle of program evaluations conducted within the Directorate for Education and Human Resources. Specifically, a baseline descriptive evaluation activity is underway. To date, staff have collected evaluation information from the NSDL projects to provide a set of key issues that will serve as a foundation for the program impact evaluation, and a task force of external experts in the area of cyber-enabled learning have been working to propose a possible framing of the program and impact evaluation. NSDL also will undergo an assessment this fiscal year by a group of Committee of Visitors (COV). COV evaluations provide NSF with external expert judgments in two areas: (1) assessments of the quality and integrity of program operations and program-level technical and managerial matters pertaining to proposal decisions; and (2) comments on how the results generated by awardees have contributed to the attainment of NSF's mission and strategic goals.

Generally, it is standard for EHR's programs to undergo descriptive, formative, and monitoring evaluation activities. For example, the last COV for NSDL held in FY 2006 identified strategic priorities for EHR's managerial staff to "create a clear compelling vision and mission for NSDL" and to "develop the plan for transition into next structural phase of NSDL". Collectively, those sources of expertise have informed NSF's decision to shift the model of support for services.

QUESTION: Does Administration plan to transfer the NSDL over to the Department of Education – like it proposed for your K-12 math and science partnership program?

ANSWER: There are no such plans. We expect to continue support of cyber-enabled learning, within this model and others as appropriate.

QUESTION: Most importantly, what will happen to this on-line science education resource when NSF ends its support this year? And how will new teaching materials being developed in one location continue to be widely disseminated without this NSDL backbone network?

ANSWER: As noted above, we expect to continue our support of the NSDL education resources. In FY 2008 the program anticipates making 4-8 grant awards in its *Pathways* track, in which investigators organize materials so as to be most useful to particular communities of learners; 4-6 awards in the various components of the *Services* track, in which investigators explore technical issues that advance the goal of making materials effectively available; and 10-15 awards for *Small grants* for projects that build on and extend progress in other tracks, with a special focus on discovering how NSDL resources impact learning. In addition, a separate technical network services project and an NSDL Resource Center award will be made as cooperative agreements, as we phase in the new core services model.

QUESTION: It seems you are about to walk away from a substantial investment with no real transition plan for this important science education resource. What is wrong with providing a deliberate transition phase out process – similar to the ones often used when phasing out support for your engineering and science and technology centers?

ANSWER: We emphasize that support for the NSDL will continue, even as the model for central services changes. In FY 2008, a phase-out award is being made to the present Core Integration Laboratory (CI). Project leadership is aware that we are moving toward the less centralized model described above, in which technical services are supported separately from leadership activities such as the formation of new partnerships and the management of the annual meeting. They know also of NSF's increasing emphasis on sustainability of individual innovations after the completion of the NSF investment. The opportunity to apply for the new awards for the technical services project and the NSDL Resource Center will be announced to the community in the FY 2008 general solicitation. Members of the present CI group may compete for these awards.

CLIMATE CHANGE

In 2007, the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) was released, providing major scientific updates on the physical processes of climate change, observed and anticipated impacts and vulnerabilities, and technology and policy options to address climate change. The CCSP is about halfway through the 10-year Strategic Plan of the CCSP. In the presentation of the budget for FY2009, NSF Director Arden L. Bement, Jr. stated, "we have made rapid advances in our understanding of climate change and its impacts."

QUESTION: What have been the most important advances in reducing the uncertainties regarding climate change and providing information needed by decision-makers to evaluate optimal strategies to address climate change (as foreseen by the President in establishing the CCSP)? What has been NSF's role in specific advances?

ANSWER: Important progress in understanding climate change and anticipating future climate states has been realized through research on many fronts. Multiple disciplines have contributed to both theoretical and observational breakthroughs as well as to major improvements in models. NSF supported research has helped to make global climate modeling more comprehensive by advancing the coupling of models of various components of the earth system. Further, NSF, in collaboration with other agencies, has taken on many major field observational activities to understand the processes that determine climate behavior. NSF supported research in "decision-making under uncertainty" is also a key contribution. Even as models improve, decision makers will continue to face some uncertainty and knowing how to better incorporate risk assessment will help them choose among options available to address climate change.

QUESTION: What are the greatest gaps in science information for decision-makers?

ANSWER: For decision makers, one of the greatest issues is obtaining information that is relevant at local and regional levels. A high priority for NSF and other agencies is to advance the understanding of scientific processes across a variety of disciplines so that the complex interactions among them will be adequately captured and characterized at scales useful to decision makers. Given the incredibly nonlinear nature of both human and natural systems, overcoming this gap will require continued research.

QUESTION: How do the IPCC Fourth Assessment and the CCSP results to date point toward shifts in priorities for climate change science investments? Which components have been sufficiently addressed, allowing attention to turn toward other priorities?

ANSWER: One of the most important things to come from the Fourth Assessment is the high level of certainty that the climate is indeed changing and that human activities are a major driver for the change. Given this, it is now critical for the CCSP to focus on increasing understanding of how earth system processes are coupled and how to predict the state of the climate under altered and evolving conditions. It will be particularly important to develop the ability to predict potential changes at local and regional levels. This requires more detailed knowledge of how local processes are linked to larger scale processes and developing the complex, high resolution models that incorporate all of the relevant processes, and their interactions, in order to produce credible and useful information.

QUESTION: Through what process does NSF evaluate the value of different alternative investments in climate change science?

ANSWER: There are a variety of processes NSF uses to evaluate the value of potential investments. NSF seeks advice from a range of advisory committees that have been established for each directorate, as well as the Advisory Committee on Environmental Research and Education, which considers cross-directorate activities related to environmental topics. Within each of the elements of the CCSP, there are scientific steering committees that help to evaluate progress and identify promising new directions. In addition, the National Research Council provides advice through a variety of standing and ad hoc committees.

QUESTION: The federal science enterprise, including NSF, invests a great deal in acquiring data. However, some people have argued that too few resources are allocated to validating, storing and making accessible the data that are acquired, and that lack of long-term data sets is a handicap in many areas of science related to climate change, such as observation of wildlife. Given the long time frame of the climate change issue, a lack of long-term data may be particularly critical. How would NSF's climate change investment help address this gap?

ANSWER: NSF supports projects, both through its core programs and its specific CCSP activities, which involve collecting data on wildlife. Data from these studies are made publicly available under the existing NSF data policies. One specific example of a program that supports long term data collection is the Long Term Ecological Research (LTER) program, whose long term collection of biodiversity datasets is available on the LTER website and which has led to a number of peer reviewed publications.

Creating long term data records can be challenging, but there are several ways in which longer term records can be developed. One is through the use of proxy data where climate information can be inferred from other observations. Tree rings are a well-known example, but there are many other ways to infer data. Another way is to use modern data assimilation techniques that can utilize relatively sparse data in today's coupled models to produce better estimates various climate variables. This type of integrated earth system analysis capability is an interagency priority.

QUESTION: NSF has a specific program component in the CCSP called "Human Contributions and Responses." Please describe in more detail what this component is, and specific outcomes you expect from the proposed investments.

ANSWER: NSF supports basic research on the processes through which people (individually, in groups, or through organizations) interact with natural environmental systems. Programs support projects that focus on decision making under uncertainty associated with climate change. These projects are expected to produce new knowledge and tools that should facilitate improved decision making by various stakeholder groups trying to deal with uncertainties associated with future climate variability and change.

Since the early 1990s, NSF has supported research on the ways that people perceive and attempt to deal with climate change. These studies have resulted in high quality, widely disseminated, peer-reviewed articles on a broad array of topics, including conservation measures, public understanding, communication of long-term risks, treaty effectiveness, and economic options for mitigation. NSF continues to fund such research, including regulatory frameworks for CO_2 sequestration and strategies to promote the adoption of newly emergent energy efficient technologies and practices. Specific outcomes will be the identification of formal and informal barriers to mitigation and effective strategies to promote mitigation.

Since 2004, NSF has supported three large-scale projects on Decision Making Under Uncertainty (at Arizona State University, Columbia University, and Carnegie Mellon University) and two smaller teams (at University of Colorado-Boulder and RAND). These groups have advanced basic understanding of decision making with respect to climate change and also developed tools to aid decision makers in incorporating current understanding of climate change, complete with uncertainties, into their decisions. The Decision Center for a Desert City at Arizona State University, for example, is working with water managers to develop useful tools that incorporate climate change information into hydrological and economic models. In a similar way, RAND has worked with water administrators in California to introduce new robust methodologies of decision making to clarify long-term options to ensure water availability in a climatically changed world. Improvements in land-use models that are tied to climate change uncertainties will continue to help inform decisions by private and public sector organizations as well as individuals in many nations.

NSF'S CONTRIBUTION TO POLAR SCIENCE

The International Polar Year is running from March 2007 to March 2009. It is an internationally coordinated, intensive, two-year study of the Arctic and Antarctic, in the context of global climate change, but with a number of inter-disciplinary topics and themes.

QUESTION: Why is the proposed increase in polar research funding a priority in the context of climate change science?

ANSWER: Investments made during the International Polar Year (IPY) are funding research addressing what drives polar climate change and how it links to and impacts global climate change. Examples include issues that were subsequently identified in the recent IPCC report as introducing considerable uncertainty in predictions of future climate change, such as changes in the great ice sheets in Greenland and Antarctica and how they might contribute to future sea level rise, and also the role of tundra and the oceans in the carbon cycle. A major focus of IPY is to establish key components of an Arctic Observing Network that will provide data essential to understanding why climate change is manifesting itself differently in different parts of the Arctic. Yet another is to study how ecosystems and their living constituents react to changes in the physical environment. Funding activities that bring together the disparate findings from research funded by NSF, NASA, and NOAA with those funded by other governments will have high priority in FY 2009.

QUESTION: What will be the lasting benefits of a two-year surge in funding, especially if the higher levels cannot be maintained?

ANSWER: Data sets collected and preserved for study by future generations of scientists, the lasting international collaborations among scientists being fostered by IPY, and the interest in science at the frontiers that IPY seems to be catalyzing in the American public and in our young people will all be durable legacies of IPY. These, combined with a better appreciation of how changes in the polar regions link to the global earth system will justify the effort that the U.S. research community and our government have committed to IPY.

QUESTION: Why is it more important to fund research at the poles, than to fund ecological, geological or paleoclimatological research in places closer to home, in the United States? Especially, why invest in polar research, rather than other kinds of climate change dynamics, impacts and adaptation in North America?

ANSWER: Potential changes in the Greenland and Antarctic ice sheets could change living conditions for millions of people around the globe through their impacts on global sea level. Secondly, the polar regions function in the global earth system as enormous "heat sinks" that influence and link strongly to mid-latitude phenomena. Thirdly, the Greenland and Antarctic ice sheets contain information not obtainable elsewhere about past climate change, providing information that can be used to benchmark our understanding of changes in the natural system. We would not argue that polar research is more important than that focused on places closer to home, only that without it unique and critical pieces of the puzzle would be missing.

QUESTION: Please name two or three specific questions that you anticipate the proposed increase in funding will be able to answer, that scientists would not be able to answer without the increase?

ANSWER: We believe research funded in our FY 2007 - 2008 IPY programs have catalyzed an international effort that will enhance our understanding of the extent to which the Greenland and Antarctic ice sheets might increase global sea level in future decades and centuries. If sustained in FY 2009 they will enable U.S. scientists to continue to play leadership roles in these international collaborations and in the synthesis work that will provide substantially more definitive answers to that question than are now available. In a different area of research the increased funding would provide for the costs of extending the time scientists can study ecosystem changes into the period of gathering darkness and increasing cold in the McMurdo Dry Valleys. Previous measurements show that the living elements in the ecosystem continued to evolve during the long winter; only now is it becoming possible to study how those changes occur. This work is likely to provide new information about how organisms adapt to and function in these extremely inhospitable environments. Finally, the increased funding would enable us to replace diesel generators at our research station in Summit, Greenland, with wind turbines, thereby reducing the impact of diesel emissions on atmospheric measurements made by NSF-supported climate scientists there.

NSF'S NEW INITIATIVE ON DYNAMICS OF WATER PROCESSES IN THE ENVIRONMENT

QUESTION: NSF proposes to initiate a program related to climate change impacts on water: "Dynamics of Water Processes in the Environment.". Please describe the "fundamental discovery" and the applied aspects of research in this initiative.

ANSWER: NSF's mission is directed at fundamental research, rather than applied research. Nevertheless, there are implications or products of fundamental discoveries regarding the water cycle that have value for or inform applied research. For example, building a more precise model of regional precipitation and runoff patterns based on fundamental processes in the water cycle could lead to an applied inquiry into the effect of altered annual rainfall on various types of crops. The latter research question is more appropriate for support by a mission agency, but certainly the research design would be more applicable if informed by the amount and variability of rainfall predicted by the model derived from fundamental research.

QUESTION: For the applied aspects of the new water initiative, how does NSF anticipate engaging actual users of the new information and tools (as opposed to researchers)? What influence will engaged users and decision-makers have in identifying the most useful research to conduct, and how will NSF work to get the results into the hands and offices of people who need it?

ANSWER: NSF depends on the effectiveness of three major types of intermediaries in getting results into the hands of people who need them. First are the researchers that NSF supports. Many investigators are involved in applied research supported by state, local, or other federal agencies and communicate results directly. Particularly in Science and Technology Centers, Engineering Research Centers, and other centers and collaborative programs, NSF encourages and expects these relationships as part of the centers way of responding to "broader impacts." At Sustainability of semi-Arid Hydrology and Riparian Areas (SAHRA), for example, the relationships to resource managers and public officials concerning water management in a dry, urban area is very strong, and research results are communicated immediately. Also, the interaction with the public sector helps to define research directions. Secondly, NSF requires open access to research results and supports a wide range of cyberinfrastructure and data management tools that are open to applied as well as fundamental investigators, and public sector water resource managers. The Hydrological Information System (HIS) is an example mechanism for making water data available; it is currently supported by NSF and USGS. Finally, direct partnerships with other agencies, such as the support of HIS, also can expedite transfer of knowledge and discoveries to those who can use them in local and regional planning.

QUESTION: Similarly, how are the federal agencies responsible for managing or ensuring the quality of U.S. water resources involved in defining the NSF initiative? How will those agencies be involved in judging among the competitive proposals for grants?

ANSWER: Plans will be developed during the coming year to define how federal agencies wish to be involved with NSF in this area of research. The National Science and Technology Council's Subcommittee on Water Availability and Quality (SWAQ) and previous water workshops have received input from many federal agencies concerning research needs. Additional contacts and workshops will be used to update and refine these interests. Also, the extent and manner of other agencies' involvement with the review process will be explored. NSF has considerable experience with many types of partnerships, ranging from simple transfer of funds to including federal employees on review panels to joint management of the review process and joint funding of awards.

SCIENCE AND TECHNOLOGY CENTERS

The budget request includes $15 million for a competition to add five to seven new Science and Technology Centers. As you know, the STC Program advances discovery and innovation in science and engineering through the integration of cutting-edge research, education program, targeted knowledge transfer, and development of a diverse workforce.

QUESTION: What steps will be taken in FY08 to lay the groundwork for these new Centers. Are there specific research topics or research goals that the NSF will try to focus on through these STCs?

ANSWER: The Science and Technology Centers program is a cross-Foundation program aimed at advancing areas of national importance across the spectrum of science and engineering supported by the NSF. STCs are bold interdisciplinary efforts, potentially transformative with ambitious visions that foster science and engineering in service to society.

NSF is taking several steps to lay the groundwork for new Centers:

- The Office of Integrative Activities (OIA) is taking the lead in informing the science and engineering community of the new competition. A program solicitation is in preparation and will be issued in May or June 2008. OIA is re-designing its website to draw attention to the new STC competition and has posted notice of the pending release of the solicitation.
- OIA and the directorates and offices are establishing a Coordinating Committee with representation across the Foundation that will advise and oversee the competition.
- NSF staff are responding to direct inquiries and following up on past inquiries.
- Staff presentations to state, regional, and national groups highlight the new competition with the goal of disseminating the information broadly.

The new solicitation will maintain the program's core approach of requiring the integration of research, education, knowledge transfer, and diversity into a coherent effort to investigate the frontiers of knowledge. We do not plan to confine proposals to selected topics in advance. Drawing broadly from documents such as the NSF Strategic Plan, the Administration's American Competitiveness Initiative, and Congress's America COMPETES Act, the solicitation will emphasize the need for interdisciplinary approaches to solving the grand challenges emerging from S&E disciplines, building strong R&D efforts, and developing and sustaining a highly skilled and globally engaged S&E workforce. The solicitation sets a framework from which diverse sets of partner institutions and individuals can exploit opportunities in science, engineering, and technology in service to society.

QUESTION: The President's budget request adds $690,000 for planned growth in its 2008 Class of Generation-3 Engineering Research Centers. Would you elaborate on the directions that this planned growth might take?

ANSWER: The Generation 3 ERCs will create a culture of innovation in engineering research and education that links scientific discovery to technological innovation through transformational engineered systems research. They will develop a culture of discovery and innovation through partnerships among academic researchers, small innovative firms, and larger industrial and practitioner partners and will build bridges from science-based discovery to technological innovation by focusing on research needed to realize transforming engineered systems.

1. The new ERCs will have a stronger focus on combining fundamental research and research and education focused on innovation. The innovation focus will support small firms engaged in translational research within the ERC's research program to speed innovation and expose students to the innovation process. Partnerships will include state, local government, or academic programs designed to stimulate entrepreneurship. Support for industry partners will not come from ERC program funds.

2. The new ERCs will prepare their students for success in the global economy, and may include a foreign university as a core partner. Support for the foreign university is to be provided by foreign sources.

3. The education program will develop graduates who are experienced in the creative process and cross-cultural collaboration to make them successful innovators in the global economy.

In FY 2008, five new Gen-3 ERCs will be awarded. The requested increase of $690,000 will provide funding needed to ramp up the funding levels of these ERCs for their second year.

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON COMMERCE, JUSTICE, SCIENCE, AND RELATED AGENCIES
HEARING ON
APPROPRIATIONS FOR FY 2009

February 27, 2008

Questions for the Record Submitted by Ranking Member Rodney P. Frelinghuysen to
Dr. Arden Bement, Jr.
Director
National Science Foundation

POLAR ICEBREAKING

QUESTION: Your Antarctic stations are currently dependent upon resupply by sea, and therefore you rely on a continuing icebreaking capability. The operating budget for the Coast Guard's icebreaking fleet was transferred to the NSF, but I understand that the Coast Guard vessels Polar Sea and Polar Star are nearing the end of their service life. When was the last time that you used a Coast Guard vessel as your primary Antarctic icebreaker?

ANSWER: The last time a Coast Guard vessel was used as the primary Antarctic icebreaker was during FY 2005.

QUESTION: How have you accomplished your Antarctic icebreaking needs since that time?

ANSWER: Antarctic icebreaking needs have been accomplished since FY 2005 as follows:

- In FY 2006, the Russian icebreaker *Krasin* was the primary Antarctic icebreaker, with assistance from the USCG's *Polar Star*.
- In FY 2007, the Swedish icebreaker *Oden*, chartered for logistics and science cooperation under the U.S.-Sweden S&T Agreement, completed a scientific cruise and was the primary Antarctic icebreaker. The USCG's *Polar Sea* assisted in the final days of the break-in.
- In FY 2008, the *Oden* completed a scientific cruise and the Antarctic break-in.

QUESTION: How much did it cost you this season to contract for the use of a private foreign vessel? What are the advantages and disadvantages of contracting for the use of a private foreign vessel?

ANSWER: The cost to charter the *Oden* for a scientific cruise and the Antarctic break-in was approximately $9 million, and this was funded out of standard programmatic funds allocated to the Office of Polar Programs. This amount reflects an escalation of approximately $1.5 million for additional fuel and an adjustment in the exchange rate.

There are several advantages:

- With the *Oden*, NSF pays only for the period of time that is needed to complete a scientific cruise and/or the Antarctic break-in. In addition, the officers and crew remain with the ship year after year, becoming increasingly experienced and efficient.
- Except for fluctuations in the exchange rate, the negotiated cost is fixed. NSF costs do not increase if, for example, the vessel incurs damage, needs extensive maintenance, or operating costs are otherwise higher than expected.
- The chartered vessels do not take fuel from McMurdo tanks.

A current disadvantage is that the long-term availability of private icebreakers is not known. NSF has secured an arrangement with Sweden to use the *Oden* for a five-year period beginning in 2008. NSF's agreement for using the *Oden* is based on the U.S-Sweden Science and Technology Agreement signed by our two countries in 2006. (A copy of the agreement is available to the Subcommittee upon request.) However, if the U.S. were to decide today to construct a new icebreaker, it would likely not come on line for another 8-10 years. Another concern is a repeat of ice conditions – in terms of thickness and extent – experienced several years ago and caused by the presence of an iceberg blocking McMurdo Sound. Under those conditions, the USCG required that NSF obtain a second icebreaker to assist the USCG's polar icebreaker. It is not clear that either the *Oden* or a polar class icebreaker could perform the Antarctic break-in alone under these conditions.

Reimbursement to USCG is not affected by the chartering of the *Oden*.

QUESTION: **What is the current status of the Coast Guard vessels and how much are you paying this year to the Coast Guard, and for what specific costs associated with those vessels?**

ANSWER: The most recent estimate from USCG for USCG icebreaking for FY 2008 is $55.7 million.

The *Polar Star* is in caretaker status. The associated FY 2008 cost to NSF is just under $3 million, consisting of $2.6 million for the reduced crew, and the balance for miscellaneous costs such as utilities and communications.

The *Polar Sea* is operational. Approximately $28.2 million has been budgeted:

- $9.1M Personnel
- $4.6M Operations & Maintenance (includes fuel). Operations in FY 2008 will be limited to a cruise in the Arctic for crew training purposes and it may also be possible to accommodate limited "science of opportunity" activity.
- $14.5M Depot Maintenance/System Recapitalization

The *Healy* is also operational, and costs are expected to be $24.5 million:

- $ 6.0M Personnel
- $ 6.0M Operations & Maintenance (includes fuel). Operations in FY 2008 are for science expeditions organized by NSF and NOAA.
- $12.5M Depot Maintenance/System Recapitalization

QUESTION: **What are you requesting for icebreaking in FY09?**

ANSWER: The FY 2009 budget request, based on an estimate from USCG during budget preparation earlier this year, is for $54 million. NSF has determined that it is no longer cost-effective to maintain the *Polar Star* in caretaker status and is no longer providing $3 million for this vessel. NSF will be negotiating with USCG this summer regarding funding for the *Polar Sea* and the *Healy*. The Swedish icebreaker *Oden* is estimated to cost $9 million in FY 2009 for a scientific cruise and the Antarctic break-in, and this would once again be paid for out of standard programmatic funds within the Office of Polar Programs and not from the USCG Icebreaker allocation of $54 million.

QUESTION: Absent any major investment in new US icebreakers, are you working to develop other innovative alternatives?

ANSWER: NSF learned of the *Krasin* and the *Oden* as a result of Requests for Information that NSF issued. Other responses to that RFI indicated there is some level of private sector interest in making vessels available or in constructing vessels for the purpose. The next step to follow up on that approach would be to issue a more detailed and complete Request for Proposals to provide icebreaking services on a contract basis. This approach is currently under discussion.

NSF is completing several projects that should enable us to fulfill U.S. policy to maintain a continuous presence at three stations in Antarctica even if there were a failure of the ship-borne resupply effort in some year in the future. One ongoing project will double the fuel storage at McMurdo Station. The FY 2009 Budget Request includes $3.8 million to continue construction of the additional fuel storage capability, with planned completion in 2010. It will take a minimum of 2 additional years and an estimated $18.5 million in fuel and approximately $5.0 million to charter a fuel tanker to fill the new tanks. This project would enable continued operations through one winter at McMurdo and into the following summer at South Pole Station. In addition, plans have been established for energy conservation measures and the development of alternative and renewable energies to reduce our reliance on fuel that has to be shipped in. Finally, the nearly completed implementation of a ground traverse to South Pole might enable transport of fuel to the South Pole Station from a location that is less ice-bound than McMurdo. A suitable embarkation point has not yet been identified, however. Nonetheless, the traverse should reduce the fuel consumed to move supplies to the new South Pole Station. While completion of these projects will each contribute to a more robust infrastructure for the future, they are not a substitute for ship-borne resupply of the U.S. Antarctic Program.

QUESTION: Please submit a detailed program and budget summary for polar icebreaking for fiscal years 1999 through 2009.

ANSWER:

Polar Icebreaking Costs Program and Budget Summary[1]
(Dollars in Millions)

Fiscal Year	Total Icebreaking Costs	USCG Costs[3]	Other Icebreaker Costs[4]	Ships Deployed -- Antarctic/Arctic
1999	3.52	3.52		1 Polar Class
2000	3.17	3.17		1 Polar Class
2001	4.32	4.32		2 Polar Class / Healy
2002	10.09	10.09		2 Polar Class / Healy
2003	13.52	13.52		Polar Sea, Healy / Healy
2004	15.46	15.46		2 Polar Class / Healy
2005[2]	14.36	9.57	4.79	Polar Star, Krasin / Healy
2006	70.78	60.44	10.34	Krasin (with Polar Star) / Healy
2007	63.44	55.70	7.74	Oden (with Polar Sea) / Healy
2008 est	64.72	55.72	9.00	Oden / Healy, Polar Sea
2009 est	63.00	54.00	9.00	Oden / Healy

[1] Until FY 2005 icebreaking costs represents costs paid by NSF to the vessel operator and the cost of fuel provided from McMurdo stocks. After this date, NSF was assigned responsibility for maintenance and system recapitalization of USCG ships.

[2] In addition to the operating and fuel costs of $9.57 million, NSF paid $9.20 million for USCG's deferred maintenance.

[3] Costs shown under "USCG Costs" includes only the cost of USCG personnel, operation and maintenance of the vessels, and depot level maintenance and system recapitalization.

[4] Costs shown under "Other Icebreaker Costs" are for non-USCG icebreakers and fuel given to USCG icebreakers.

USCG Icebreaking - Program and Budget Summary
(Dollars in millions)

	Polar Star		Polar Sea		Healy		Total	
FY	Total	*Maintenance/ System Recapitalization*	Total	*Maintenance/ System Recapitalization*	Total	*Maintenance/ System Recapitalization*	Total	*Maintenance/ System Recapitalization*
2006	$10.63	$0.00	$26.08	$14.50	$23.35	$7.80	$60.06	$22.30
2007	2.62	0.00	24.75	12.50	26.41	14.50	53.78	27.00
2008	3.00	0.00	28.21	14.50	24.51	12.50	55.72	27.00
2009	0.00	0.00	TBD	15.00	TBD	15.00	54.00	30.00

Maintenance and System Recapitalization are shown above as a subset of the yearly totals, and sum to nearly $110 million over the four-year period. FY 2009 total amount is an estimate.

DATA SECURITY

QUESTION: According to the GAO, the NSF has not adopted any of the five measures recommended by OMB to protect personal information. Please submit a description of what steps NSF is taking on each of these five measures.

ANSWER: NSF is pleased to report on actions we have taken to address the five measures in the Office of Management and Budget (OMB) Memorandum 06-16 "Protection of Sensitive Agency Information." NSF has implemented a majority of the five OMB M-06-16 privacy recommendations and requirements to date.

A chart reflecting the status of NSF's compliance with OMB Memorandum M-06-16 follows.

OMB M-06-16 *Protection of Sensitive Agency Information*
(Issued June 23, 2006)

Description (from GAO)	NSF Status
Recommends that all agencies: (1) encrypt all data on mobile computers/devices that carry agency data unless the data are determined to be nonsensitive;	**Policy Completed.** The "NSF Policy on Encryption for Mobile Computing," which mandates encryption of all NSF data on mobile computers and devices, was issued on June 29, 2007. NSF provided this policy to GAO on September 18, 2007, as part of GAO's "Protecting Personally Identifiable Information" review (GAO-08-343). **Implementation Status: In Progress.** NSF has deployed data encryption capability for laptops, and is currently deploying encryption capability for BlackBerry devices. Timeframe for completion is October 2008.
(2) allow remote access only with two-factor authentication, where one factor is provided by a device separate from the computer gaining access;	**Policy Completed.** The "NSF Password Policy," which requires use of two-factor authentication, was issued on June 29, 2007. NSF provided this policy to GAO on September 18, 2007, as part of GAO's "Protecting Personally Identifiable Information" review (GAO-08-343). **Implementation Status: In Progress.** NSF implemented two-factor remote authentication for agency-level systems in June 2007 with remaining requirements to be completed by October 2008.
(3) use a "time-out" function for remote access and mobile devices requiring user re-authentication after 30 minutes of inactivity; and	**Policy Being Circulated for Approval.** NSF policy updates to reflect this (already implemented) requirement will be completed by March 2008 **Implementation Status: Complete.** NSF implemented the 30-minute inactivity time-out requirement in May 2007.

Description (from GAO)	NSF Status
(4) log all computer-readable data extracts from databases holding sensitive information and verify that each extract including sensitive data has been erased within 90 days.	**Policy Being Circulated for Approval.** NSF policy updates to reflect this requirement will be completed by March 2008 **Implementation Status: In Progress**. NSF plans to implement the logging of all computer-readable data extracts from databases holding sensitive information, and verifying that each extract has been erased within 90 days, by October 2008.
Recommends that agencies use the NIST security checklist, included in the memo, which provides specific actions to be taken by agencies to protect personally identifiable information that is either accessed remotely or physically transported outside of an agency's secured physical perimeter.	**Policy Completed.** The "NSF Information Security Handbook" details policies and procedures to protect the confidentiality, availability, and integrity of NSF systems. The Handbook was updated in April 2006 to include specific procedures for implementing NIST Special Publication (SP) 800-53, including the controls highlighted in the NIST security checklist referenced in M-06-16. NSF provided this documentation to GAO on January 19, 2007, as part of GAO's "Protecting Personally Identifiable Information" review (GAO-08-343). **Implementation Status: Complete**. NSF has applied NIST guidelines to system certification and accreditation processes for all NSF systems since FY 2006.

NSF participated from December 2006 to September 2007 in the GAO study, which culminated in the report, "Information Security: Protecting Personally Identifiable Information (GAO-08-343)." During this time, NSF provided extensive documentation (over 50 documents) demonstrating our implementation of OMB privacy recommendations and requirements. We hope the information provided today clarifies for you NSF's extensive efforts to implement government-wide privacy policies.

The Honorable Alan B. Mollohan
Subcommittee on Science, State, Justice, and Commerce and Related Agencies
Committee on Appropriations
U.S. House of Representatives
February 27, 2008.

BOARD v. FOUNDATION

Gentlemen, NSF has an unusual structure for a Federal agency with a governing board whose role includes oversight. Working out a proper degree of autonomy and a workable balance of cooperation is a challenge. I would like each of you to describe for the Committee the particular challenges that have arisen this past year in your dealings between your respective bodies. I might also say before you answer my question that it is but one measure of a man who can articulate his successes, challenges and failures as his counterbalance is seated next to him.

Background

All 24 members of the Board have been appointed by President Bush. The Board identifies issues that are critical to NSF's future; approves NSF's strategic budget directions; approves annual budget submissions to the Office of Management and Budget; approves new programs and major awards; analyzes NSF's budget to ensure progress and consistency along the strategic direction set for NSF; and ensures balance between initiatives and core programs. Tensions between the Office of the Director and the NSB anecdotally have increased in the past three years – perhaps as the Board has taken a complete Bush-like complexion – and NSF employees who support NSB committees, we are told, find it increasingly difficult to do their jobs professionally.

Follow-on Question:

QUESTION: The strength of the Foundation is to have an engaged Board, apolitical, overseeing and evaluating the Foundation's management and programs. To both of you, has this oversight been effective?

ANSWER: The relationship between the Board and the Foundation is a very effective one in overseeing and evaluating the Foundation's management and programs. The NSF Act established the National Science Foundation in 1950 to "consist of a National Science Board...and a Director." The Foundation has been very successful in its mission for more than a half century in great part because of this very positive relationship.

QUESTION: Dr. Beering, what changes in the Board's oversight do you envision this coming year and what has precipitated this focus?

ANSWER: The Board has completed or will soon complete a number of studies on issues raised in the America COMPETES Act for Board response, as well as several policy issues that the Board has brought to the attention of the President and Congress, in accord with its statutory responsibilities. These include, in response to America COMPETES, issues of support for interdisciplinary research, limitations on proposals to a single institution, funding for operations and maintenance for projects in the Major Research Equipment and Facilities Construction (MREFC) Account, and cost sharing on NSF grants. We will continue to consider the implementation of the recommendations in the Board's STEM Action Plan for the role of NSF in precollege STEM education, with a new policy activity focusing on future innovators. We will also continue to oversee the implementation of the Board's recommendations to NSF for transformative research, international science and engineering partnerships, improving engineering education, developing new indicators of the state of U.S. science and engineering, and developing recommendations for the NSF role in sustainable energy in the forthcoming report on that subject.

SCIENCE AND ENGINEERING INDICATORS

The Committee appreciates the work of the Board in developing the report, *Science and Engineering Indicators 2008*. It makes clear that we are at a critical time for the Nation in science and engineering. The report shows that the U.S. remains the world leader in scientific and technological innovation, but our leadership is being challenged in many areas.

QUESTION: Which trends concern you the most?

ANSWER: With *Science and Engineering Indicators 2008*, the Board issued an independent policy statement, *Research and Development: Essential Foundation for U.S. Competitiveness in a Global Economy*, which may or may not reflect the views and policies of the rest of the Executive Branch. The Board's policy statement expressed concern with the decline in Federal funding to academic research for the first time since the early 1980s, even though experience has shown basic research to be a major driver for innovations that result in new industries and new jobs that will enhance U.S. global competitiveness. We are also concerned about the indicators of decline in interaction between academic and industrial scientists in basic research, especially the decline in participation by industry scientists in the open peer-reviewed literature and basic research R&D in academe, with potentially negative impacts on the awareness of academic researchers of the major research challenges that face U.S. industry and industrial competitiveness. The Board continues to be concerned with the state of U.S. STEM education at the precollege level, the subject of our Companion Piece to the 2006 issue of *Indicators*, with special attention to precollege STEM teachers. Indicators show widespread difficulty in filling mathematics teaching positions, and also difficulties in filling some science teaching positions, at the same time that there is a widening gap in salaries between precollege science and mathematics teachers and those of similarly trained professionals in other fields. Achieving and sustaining a high quality STEM teaching workforce therefore remains one of our highest priorities for attention.

Background

Science and Engineering Indicators 2008, published in January 2008, found that in this changed and changing world, the U.S. continues to occupy a prominent position as the world's largest economy. On a number of broad macroeconomic fronts, it has performed well over the past twenty years. Its GDP has been robust, both overall and on a per capita basis, and its productivity has been strong. It, however, cannot match large, sustained increases in China and other Asian economies. The progressive shift toward more knowledge intensive economies around the world is dependent upon the availability and continued inflow of individuals with postsecondary training to the workforce and is reducing the U.S. advantage.

Follow-on Questions:

QUESTION: Are we living off the past? Are U.S. researchers producing the big ideas in science?

ANSWER: Indicators do not show cause for concern in the near term. The United States continues to lead in all three market-oriented, knowledge intensive service industries, industries that are increasingly dominating economies of developed countries. The U.S. also has the lead in 4 out of 5 high-technology manufacturing industries and has maintained a 35% share of world revenue of all high-technology manufacturing industries since 2001. Patent data show the U.S. leading in the filing of triadic patents—those that are filed in the three main patent centers in the U.S., Japan, and the EU—with 37% of all filings; however, though the U.S. retained its first rank in share of highly influential articles in peer reviewed journals in all major fields except physics over the period 1992 to 2003, overall it lost share of highly influential articles, dropping from 63% to 58%. U.S. annual growth in all S&E article publications in peer reviewed journals also slowed in the period 1992-2003 over the previous period, below the rate of growth of other major publishing centers. This trend suggests that other countries and regions are becoming more competitive in performing cutting edge science and engineering research, rather than a decline in U.S. innovation.

QUESTION: We hear lots of news about how strong India and China are in science and technology. Are they really overtaking the U.S.?

ANSWER: The U.S. is still the world leader in science and technology. However, our indicators show that China is rising rapidly, investing in capabilities associated with high growth high-technology industries, and has captured a growing export share of high technology manufacturing, reaching a 20% share in 2005, while the U.S. declined in share from 23% to 12%, Japan from 21% to 9% and the EU from 39% to 28%. Similar indicators on India are not available.

QUESTION: Are U.S. science and engineering jobs in danger?

ANSWER: There is no statistical evidence of decline in science and engineering jobs in the U.S. Available data on employment in science and technology show robust growth in S&E occupations, far exceeding the growth in the workforce overall from 1983 to 2006, with Census estimates that S&E occupations increased from 2.6% to 4.2% of all occupations over the period, even while the overall workforce grew. The Board has expressed its concern that the decline in high-technology manufacturing exports may impact U.S. jobs, but currently available trade metrics do not allow us to make an assessment of impacts on the job market. The Board urges in its recent Companion Piece to *Science and Engineering Indicators 2008*, *Research and Development: Essential Foundation for U.S. Competitiveness in a Global Economy*, that appropriate metrics to examine the effects of global high technology economy on U.S. jobs be addressed by Federal agencies.

QUESTION: Where are the biggest needs in STEM education? Is NSF doing what's needed?

The Board continues to be concerned with the preparation of U.S. citizens for higher education in the precollege system. The Board's. recently published independent report, *National Action Plan for Addressing the Critical Needs of the U.S. Science, Technology, Engineering, and Mathematics Education System* (2007), recommends two major areas for attention: first, coherence in the STEM education system, including both horizontal coordination across states and vertical alignment across grade levels; and second, well-prepared and highly effective STEM teachers. The NSF Directorate for Education and Human Resources has presented to the Board its strategy for aligning programs of the NSF/EHR Directorate with the recommendations of the Board's Action Plan. Though STEM education is primarily the responsibility of state and local government, NSF can contribute importantly to both critical areas identified in the Board's STEM Action Plan through its science and engineering education programs to: promote learning through research and evaluation; broaden participation to improve workforce development; promote cyber-enabled learning strategies to enhance STEM education; enrich the education of STEM teachers; and further public understanding of science and advance STEM literacy. The NSB Action Plan explicitly supports a number of current NSF programs as addressing the goals of the Action Plan.

QUESTION: We get mixed signals about the science and engineering workforce. Industry says it has trouble finding highly-skilled U.S. workers. But, we also hear about young scientists starting their careers. What's going on?

ANSWER: The mixed signals are the result of what can be widely differing employment conditions in different fields of science or engineering and at different degree attainment levels in the same field. On the overall workforce level, the U.S. continues to depend on international students and scholars to fill positions in its science and engineering workforce, because the U.S. education system does not produce enough American graduates to fill all such positions. Indeed, as S&E employment averaged 4.2% annual growth between 1980 and 2000, S&E degree production increased an average of only 1.5% annually.

The Board's recent study and report on engineering education, *Moving Forward to Improve Engineering Education* (2007), notes that even as engineers continue to command high salaries on graduation in comparison with other baccalaureate degree recipients, and unemployment continues to be lower in science and engineering fields than in the workforce generally, employment remains a concern for students. The National Academy of Engineering in its Engineer of 2020 initiative has examined the issues in depth and identified the need to prepare engineering students to adapt to what is an increasingly global workforce for engineering.

Some of the greatest concerns for scientists and engineers are at the Ph.D. level, rather than the baccalaureate level. Even though less than half of Ph.D.s are employed by academic institutions, the focus of Ph.D. education has been the preparation of future faculty and academic researchers. Academic faculty positions have grown slowly relative to other S&E employment. The Board's report, *The Science and Engineering Workforce—Realizing America's Potential* (2003), urges that it is "in the national interest as well as the interest of individual students and scholars that the Federal Government – with other stakeholders in the S&E workforce – take action to guide the advanced education of scientists and engineers to better align with expected national skill needs." In sum, the mixed signals reflect in whole or in part real difference in employment conditions for different fields and subfields of science and engineering in the workforce and at different levels of degree attainment.

QUESTION: Dr. Beering, in your companion piece to *Science and Engineering Indicators 2008*, *Research and Development: Essential Foundation for U.S. Competitiveness in a Global Economy*, you directed attention to a declining trend in Federal funding for academic research, flat funding by industry and the Federal Government for their own basic research in this century, and the decline in the share of academic R&D by industry. At the same time, you show a long term rise in U.S. total R&D funding—to $340B in 2006--and that the U.S. funds more R&D than any other country, and more than the European Union in total. My question is, then, what do you believe is enough Federal funding for academic research, and why?

ANSWER: The Board concluded in its *Working Paper on Government Funding of Scientific Research* (1997) that the Federal R&D budget as a whole should be adequate both to serve national priorities and to foster a world-class scientific and technical enterprise, so that the U.S. will be among the leaders in all major fields of science and the leader in selected major fields. In addition Federal support for research should include funding for fields and investment strategies that hold the greatest promise for new knowledge that will contribute to important national goals, including among them extending our understanding of nature. With Federal funding increasingly important in sustaining research infrastructure in the academic sector, it is more critical than ever that the Federal Government remain committed to its essential role in funding academic research, which implies the need for reasonable increases in a growing national science and technology enterprise, rather than the declines we see in recent years. In this regard, we appreciate the strong support for basic research in the President's American Competitiveness Initiative.

QUESTION: You suggest in your companion piece report that we may need to reconsider the traditional Federal Government investment strategies for basic research to more effectively support the connections between R&D investments and U.S. competitiveness in the global economy. Did you have any specific suggestions in this regard?

ANSWER: There are some immediate actions we recommend to increase the effectiveness of our national investments in R&D. We note the need to encourage greater intellectual interchange between industry and academia—in part by encouraging industry researchers to participate as authors and reviewers for articles in open, peer-reviewed publications. We also note the need for new metrics to help us understand the implications for the U.S. economy of globalization of high technology industry, and recommend that Federal agencies should address this need expeditiously. As these new metrics allow us to improve our understanding of the new global environment for science and technology innovation, we can adapt Federal investment strategies for basic research to more effectively support U.S. global competitiveness in science and technology.

QUESTION: Your companion piece report starts out making a connection between new scientific knowledge and jobs, with a 1945 quote from Vannevar Bush in *Science—The Endless Frontier*, a proposal to the President that resulted in the establishment of the National Science Foundation in 1950. Do data in your new volume of *Science and Engineering Indicators 2008* support the connection between basic science and engineering research and job growth?

ANSWER: There are a number of indicators that support the contribution of research to job growth. Clearly, and most obviously, important innovations in science and technology applied in medicine, in telecommunications, computation, aerospace, and other areas are continually creating new career opportunities that never existed before. In addition, the Board's biennial publication of *Science and Engineering Indicators* continues to report much higher growth in science and engineering occupations than in the workforce generally. The growth rate for S&E occupations between 1990 and 2000 was more than triple the rate of growth of all occupations, and more recent data suggest that the growth has remained robust in the first half decade of the new century. Even in occupations that are not considered science and engineering, the demand for science and engineering skills is growing. Almost 13 million workers reported that they need at least a bachelor's level of knowledge of science or engineering in their jobs.

QUESTION: You report in *Science and Engineering Indicators* that the number of foreign-born workers in the U.S. science and engineering workforce more than quadrupled between 1980 and 2000, and now represents almost 1 in 5 members of the S&E workforce. You also show a record number of temporary high-skill-related visas issued in 2006. Do you find evidence that large numbers of foreign-born S&E workers are depressing wages that might otherwise attract more Americans to science and engineering studies and careers?

ANSWER: We do not show any evidence that foreign-born S&E workers depress wages for Americans. Estimates of median salary at different points in a person's working life for individuals with bachelors' degrees show that, in a range of fields, after the first four years holders of S&E bachelor's degrees earn more than those with non-S&E degrees at every year since the degree was received. Median salaries for S&E bachelor's degree holders in 2003 peaked at $65K 15-19 years after the degree, compared with $49K for those with non-S&E bachelor's degrees. Those with S&E related degrees such as technology, architecture, or health, peaked at $52K at 25-29 years after the degree was received, still higher than non-S&E graduates but less than S&E degree holders. Clearly, the high number of foreign-born S&E workers has not depressed wages in any detectable way, since the median earnings of S&E degree holders exceed those of other degree holders.

QUESTION: Your *Digest of Key Science and Engineering Indicators* reports that over half of public secondary schools in the U.S. had vacancies in mathematics teaching positions in 2003-4, and about one third of those—about 20% of all public secondary schools--reported difficulty finding teachers to fill the positions. You also report that mathematics and science teacher salaries continue to lag behind salaries for other professions, and that the gap has widened, and that about half of mathematics and science secondary school teachers were not satisfied with their pay. Do you have any evidence that raising salaries for secondary school mathematics and science teachers would increase the available pool of such teachers?

ANSWER: In our Companion Piece to the 2006 volume of Science and Engineering Indicators, *America's Pressing Challenge-Building a Stronger Foundation*, the Board looked at the question of how to develop and retain a high quality mathematics and science teaching workforce. In that report, we recommend that resources be provided to compensate precollege teachers of mathematics, science and technology comparably with similarly trained S&E professionals in other economic sectors. However, we also urged a range of other actions—ones that would improve the working environment and increase the quality of the teaching workforce. These include induction programs for beginning teachers, sustained professional development, strengthening college education programs, and investing in research on teaching and learning. We consider competitive compensation to be very important, but not the only response to the need to increase the pool of mathematics and science teachers to address the problem of filling vacancies with highly qualified teachers.

QUESTION: Your *Digest* reports that a declining percentage of college freshmen expressed interest in majoring in computer science or engineering in recent years, even though average salaries for these two majors are the highest for recent degree recipients at all degree levels, and especially high for engineering. How do you explain this apparent anomaly?

ANSWER: The Board found in our 2003 study, *The Science and Engineering Workforce—Realizing America's Potential*, that a number of factors are involved in the low participation rate by American students in some fields of science and engineering. First is a higher level of high school preparation needed to pursue degrees in natural science and engineering fields (i.e., excluding social and behavioral sciences). In addition, the curriculum for many science or engineering fields is relatively inflexible, requiring sequential acquisition of skills. At the same time, there is an increase in the share of students who are "non-traditional," that is, not attending college full time in a four year program beginning immediately after high school. Indeed, many start in two-year programs at community colleges. Because of the need for adequate preparation in high school, the relative inflexibility of the coursework, and the need for relatively expensive infrastructure on the part of the educational institution in order to offer many of the science and engineering majors, many American students do not or cannot choose to major in natural science and engineering fields. This is especially true for low income students and students from some ethnic backgrounds underrepresented in science and engineering fields.

INVESTMENTS IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) EDUCATION

QUESTION: Yesterday when the Director of the Office of Science and Technology Policy appeared before the Committee we had a conversation about investments in education, and I expressed my disappointment that the budget proposes real reductions to STEM and other education programs, including at NSF. Given your recent report, Dr. Beering, does the Board believe cuts in math and science education activities at NSF are well-advised?

ANSWER: The Board has remained committed to enhancing programs in the Education and Human Resources (EHR) Directorate to achieve priorities for STEM education. Our recent *National Action Plan for Addressing the Critical Needs of the U.S. STEM Education System* has identified priority focus areas in STEM education for NSF. To assure the effectiveness of the programs we are funding, NSF has required since 2005 that every proposed project include an evaluation plan at the time of proposal submission. By focusing on priority areas and identifying through evaluations those programs that are most effective in achieving priority objectives, NSF is able to maximize benefits achieved for STEM education regardless of funding level. Nevertheless, the President's FY 2009 Budget Request does include a 9 percent increase for the EHR Directorate.

Background

The Organization for Economic Cooperation and Development has ranked U.S. students 25th out of 30 developed countries in math and 21st in science. The Board's *Science and Engineering Indicators* highlight continuing concerns about the relationship of science and mathematics achievements to American global competitiveness and workforce preparation.

Follow-on Questions:

QUESTION: The Administration's FY 2009 request for Education and Human Resources (EHR) at NSF is $790.4 million, an increase of almost $65 million or almost 9 percent over FY 2008, yet the budget proposes to flat-fund two undergraduate programs, STEM Talent Expansion Program and the Advanced Technological Education Program, despite being authorized for 10 percent increases in COMPETES and within an NSF budget that grows in excess of 13 percent. What is the Board's rationale for flat-funding these and reducing other education programs, particularly in light of the *Digest of Key Science and Engineering Indicators* and your companion piece?

ANSWER: The Board is supportive of programs that have demonstrated their effectiveness through rigorous assessments in identified priority areas for STEM education. In an era of limited resources, proven effective programs addressing priority needs must take precedence. Priorities identified by the Board in its recent Action Plan for STEM Education are coordination across states and levels of education, and an adequate sized, high quality STEM teaching workforce.

QUESTION: In your opinion, Dr. Beering, what is the long-term effect of short-changing these education programs?

ANSWER: The long-term effects of modest program growth could include: first, waste of resources on programs that are not effective in achieving their objectives; second, failure to advance the state of knowledge at the speed otherwise possible; and third, and most important, reducing opportunities to learn for our students, who otherwise might have the advantage of tools developed for STEM education that are proven to be effective in careful evaluation studies under NSF grants.

LARGE RESEARCH FACILITY PROJECTS

Dr. Beering, the Committee shares with the Board and the Foundation a strong interest in continuing to improve NSF's processes for constructing large facility projects. In its recent report, the Board recommends that planning for large research facility projects be funded from the Major Research Equipment and Facilities Construction (MREFC) account. How does this improve the process?

Background

The Board just submitted an initial report in response to the requirements in the America COMPETES Act, which recommends that large research facility projects begin receiving Major Research Equipment and Facilities Construction (MREFC) funds to cover most of their planning costs instead of just for construction. Currently, planning funds are provided within the directorates.

There is not consensus within the Board on this topic and it is quite likely that the Board may offer new views in its final report.

QUESTION: I understand that this topic drew a number of divergent views and that there may not be consensus on the Board. Can you please elaborate? Is it likely that the Board in its final report may alter the recommendations of its initial report?

ANSWER: The Board's report to Congress in February 2008 reflected the Board's initial thinking on pre-construction funding and operations and maintenance costs and the desired outcomes of an effective process for managing MREFC projects. The Board is further refining its recommendations and is developing MREFC project planning, prioritizing, and funding processes, and expects to present a proposal for discussion of a detailed modification of the MREFC process later in 2008 or early in 2009.

QUESTION: Currently, the directorates provide the planning funds, so we kno-w they have to consider the tradeoffs with other needs. Under the Board's recommendation, where does the responsibility lie?

ANSWER: Gathering better lifecycle cost estimates earlier in the process benefits all decision-makers and stakeholders. The Board is concerned that any process that delivers planning/design money earlier should be clearly understood by the scientific communities involved. There should be well-defined expectations with regard to the point at which commitment to funding is set, and the Board will need to provide the oversight needed to ensure that lifecycle costs do not negatively impact NSF in the out-years.

QUESTION: Another thing we focus on is how any funds would otherwise be used. When the funds are within a program budget, we know they could otherwise be used for grants, which are truly NSF's bread and butter. If the planning funds are held centrally in MREFC, what would the alternative use be?

ANSWER: The Board will be considering whether holding the planning funds centrally in an MREFC account may allow Congress, the Board and NSF management to balance the portfolio of all MREFC projects more effectively. The National Science Foundation leadership would have to balance the use of MREFC pre-construction planning funds among all post initial stage MREFC project commitments.

QUESTION: In a broader context, are we not missing the larger question [with] respect to large research facilities – that being a strategic plan for addressing the costs of operations and maintenance at these facilities?

ANSWER: The Board is considering the larger issue of how to prioritize and be strategic in its support for large research facilities – including operations and maintenance – as it develops and refines a modified MREFC process as described above.

QUESTION: The budget proposes to fund the initial design for the advanced technology solar telescope in MREFC. Is this consistent with existing law? Does the Board's recommendation require a change in law?

ANSWER: The Board is further refining its recommendations with regard to the MREFC Account and expects to develop a detailed modification of the MREFC process by early in 2009.

PROPORTIONATE INCREASES OF SCIENCE RESEARCH AT THE NSF

QUESTION: Dr. Beering, last year before the Committee you noted that biological sciences did not request the same proportionate increases as other areas at NSF. You specifically mentioned that biology was deserving of additional funding. Given the proportionate increases again proposed in this year's budget, do you believe again that biology – and perhaps the social sciences – deserve proportionality?

Background

The request for the research and related activities (R&RA) account is $5.594 billion, $773 million (16 percent) over the FY 2008 level of $4.821 billion and $150 million less than authorized in COMPETES. In keeping with the Administration's emphasis on the mathematical and physical sciences, engineering and computer sciences under the ACI, those directorates, in addition to cyberinfrastructure, each see an approximately 20 percent increase over FY 2008, while the biological sciences (+10.3 percent) and social, behavioral and economic sciences (+8.5 percent) see modest increases. Although COMPETES does not assume that all fields will receive equal increases each year, the law does specifically call on NSF not to divest in the biological and social sciences over the long term.

In your opinion, is the proportionality represented among the sciences in the NSF's request to Congress this year appropriate, or should we be looking at parity?

ANSWER: The Board does not recommend that increases to all scientific fields should be funded uniformly. The Board is on record in its *Working Paper on Government Funding of Scientific Research* (1997) in concluding that the research budget should be adequate to ensure that the U.S. will be among the leaders in all major fields of science and the leader in selected major fields. For the Federal budget there should be areas of increased and areas of decreased emphasis. Higher levels of funding should be directed both to fostering a world class scientific and technical enterprise and needs for advances in national priority areas.

QUESTION: I understand that the National Science and Technology Council of OSTP is soon to release a report on the grand challenges for the social, behavioral and economic sciences disciplines. Are you aware of the findings of this report and do they suggest that a revision in the proportional increases between the science directorates at NSF need revision both in the FY 2009 budget request and in long-term planning?

ANSWER: The Board will be considering the findings of the report in the context of our annual long-range planning discussions later this year.

CONTRACTING OUT

QUESTION: Gentlemen, how has the privatization of certain government activities or "contracting-out" within the Foundation affected the mission of the Foundation?

ANSWER: This question has be referred to the NSF Director for response

Background

Over the past seven years, the A-76 process has been used extensively at the NSF, and it has been suggested by professional staff of the Foundation that it is harming the mission of NSF. At NSF, contracted out work now includes: supplemental cost analysis, negotiation of indirect cost rates for new performing institutions, close-out of NSF contracts, support to the large facilities office; human capital planning, redesign and maintenance of the computerized system for proposal submission, all human resources processing, and NSF's travel system. OMB is pushing the NSF to replace its time and attendance system with one of the preferred providers; efforts to outsource other financial management lines of business and information technology lines of business may be underway.

Follow-on Questions:

QUESTION: The strength of the Foundation is to have an engaged Board, apolitical, overseeing and evaluating the Foundation's management and programs. To both of you, has this oversight been effective?

ANSWER: The relationship between the Board and the Foundation is a very effective one in overseeing and evaluating the Foundation's management and programs. The NSF Act established the National Science Foundation in 1950 to "consist of a National Science Board...and a Director." The Foundation has been very successful in its mission for more than a half century in great part because of this very positive relationship.

QUESTIONS: Over the past seven years, which specific activities have been out-sourced?

Has a complete contractor inventory been completed to assess the full range of privatization efforts completed at NSF to include the number of FTE and financial savings? If so, what is that inventory? If not, why not?

What additional activities at NSF are currently planned either by Foundation, the Board or OMB to be out-sourced in fiscal years 2008 and 2009?

Please describe the Foundation's use of temporary staff employed under the provisions of the Intergovernmental Personnel Mobility Program, which provides NSF *skilled* (emphasis added) personnel from State and local governments, institutions of higher education, Indian tribal governments and other eligible governments to facilitate cooperation between the Federal Government and non-Federal entities. I understand that such IPAs are used extensively at the NSF, and perhaps almost exclusively at NSF to provide managers at the directorate, division, and program level.

For the record, please provide by directorate, division and program the number of IPAs for the last 10 years, and include the total number each year at the NSF.

Are either of you concerned that such proportional imbalances created by the increasing use of contractors or IPAs may threaten the long-term health, vitality and impartiality of the Foundation, and ultimately our investment in science? If not, why not?

ANSWER: These questions have been referred to the NSF Director for response.

ADDITIONAL QUESTIONS FOR THE RECORD

NSB

STEM Action Plan

QUESTION: What's happening now with the Action Plan? Which of the recommendations deserve highest priority?

ANSWER: The Board stressed in its Action Plan that the highest priority actions are the creation of mechanisms for coordination of STEM teaching and learning among all stakeholders and a bolstering* of the STEM teaching workforce.

At its March 2008 meeting, Dr. Cora Marrett, NSF Assistant Director for Education and Human Resources (EHR), presented to the Board an outline of what NSF's EHR is doing to promote coordination in STEM education through five core themes. Of particular note, NSF has a leading role through the Education Subcommittee of the NSTC to work with other Federal agencies to share ideas and learn from each other about ways to continue to strengthen evaluation of STEM education work

QUESTION: Some of the recommendations focus directly on other entities, notably the Department of Education. Are they addressing the recommendations?

ANSWER: The Board has no knowledge of what actions the Department of Education is taking to address recommendations in the Board's Action Plan.

QUESTION: I'm also interested in the recommendation that calls for compensating STEM teachers at market rates. That's something that is often discussed here in Congress. Who do you think should take the lead in this area? Is it something the Federal government should address?

ANSWER: The Board is cognizant that teacher salaries are set and provided by local education agencies. The Board's Action Plan, however, notes that the Federal Government could possibly play a role, and suggests some possibilities, but the lead would still remain at the state and local levels.

Science and Engineering Indicators

QUESTION: Your *Digest of Key Science and Engineering Indicators 2008* highlights the finding that the United States leads globally in 4 of 5 high technology manufacturing industries and has maintained a 35% share of world value-added revenue in these high growth manufacturing industries since 2001. You further note that rapid growth has resulted in these industries rising from 14% in 1990 to 24% in 2005 of U.S. manufacturing revenues, even as overall manufacturing revenues were rising. Nonetheless, you also report that the United States' balance of trade is negative in these high technology manufacturing industries since the late 1990s. What do these contrary indicators mean for U.S. global competitiveness in high-technology manufacturing?

ANSWER: The U.S. trading position in technology-oriented services remains strong, as evidenced by the continued surplus in trade in computer software and manufacturing know-how. But by current measures, the U.S. trade balance across all high-technology manufacturing sectors significantly declined over the last decade. However, the growing competitiveness in the global environment is resulting in new business models such that the impact of innovations might not be captured in current international trade metrics. Indeed, some transactions may involve multiple flows of information, components, products/services/applications, and payments that are not easily correlated. The Board has therefore recommended as a critical need that Federal agencies develop the data to track the implications of globalization of high technology industries and services for the U.S. economy.

THURSDAY, APRIL 10, 2008.

EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

WITNESS

NAOMI C. EARP, CHAIR, EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

CONGRESSMAN MOLLOHAN'S OPENING STATEMENT

Mr. MOLLOHAN. Good afternoon. The Subcommittee would like to welcome Naomi C. Earp, Chair of the Equal Employment Opportunity Commission, to discuss her agency's fiscal year 2009 budget request. We are pleased to see you again, Ms. Earp, and thank you for your time. You have the distinction of being the last regularly scheduled hearing of the season. I am sure we will have other hearings as the year goes on but this is the last regularly scheduled on the President's budget submissions for our Subcommittee.

Most people who have not experienced employment discrimination probably do not have a full appreciation for the depth and breadth of this problem. Employment discrimination can and does take place in this country and we rely on the EEOC to help remediate that discrimination, set precedents to deter future violations, and educate employees about their rights.

Unfortunately, the administration's budget requests for EEOC over the last five years have not been sufficient to adequately carry out these important responsibilities. Increasing receipts and decreasing staff levels have combined to create a chronic backlog of pending charges that grows bigger every year. That backlog may look like just a column of numbers on a spreadsheet but each one of those pending charges represents an employee and an employer who are waiting for closure on what is no doubt a painful and contentious issue between them. Delaying the closure has real impacts on real people and I think we need to ensure that we do not lose sight of that fact.

This year, for the first time in a number of years, the EEOC's budget proposal contains a real increase in basic operations. Specifically, the 2009 budget provides an increase of $12.6 million, or a little less than 4 percent, to slow the growth of the charge backlog and to complete the transition of the now defunct National Contact Center to an in-house capability. We are pleased to see these proposals but we remain concerned that they do not accomplish such essential tasks as actually reducing the charge backlog.

The population of the United States is getting bigger, older, and more diverse as the years pass. Ensuring that we have a robust capacity to protect basic civil rights is only going to become more important as vulnerable populations continue to grow. We will be closely examining your request to make sure that the EEOC is well positioned to help you achieve that goal. And before we invite you to offer your oral remarks, and your prepared statement will be made a part of the record, I would like to turn to our Ranking Member, Mr. Frelinghuysen, for his opening statement.

CONGRESSMAN FRELINGHUYSEN'S OPENING STATEMENT

Mr. FRELINGHUYSEN. Ms. Earp, good afternoon, welcome back. I join the Chairman in welcoming you here this afternoon to hear your testimony in regard to your budget submission for 2009. As the Chairman says, you are requesting a total of $341.9 million, which represents an increase of $12.6 million, or 3.8 percent above last year's level. Much of this increase would be devoted to recreating the Commission's customer response function in-house after the cancellation of the contract call center. Also, there is a modest increase toward reducing the significant, and as the Chairman has said, growing backlog of private sector discrimination charges.

The EEOC is tasked with preventing and eradicating employment discrimination across the United States. As the Chairman has said, yours is an important and difficult mission and we would like to work with you to find ways to maximize your effectiveness within available budgets. And again, welcome. Thank you for being here.

Ms. EARP. Thank you.

Mr. MOLLOHAN. Thank you, Ms. Earp. And again, your written statement will be made a part of the record. You can proceed.

Ms. EARP. Thank you.

Mr. MOLLOHAN. Thank you.

CHAIR EARP'S OPENING STATEMENT

Ms. EARP. Good afternoon, Mr. Chairman. I appreciate the opportunity to testify in support of the President's fiscal year 2009 budget request of $341.9 million for the Equal Employment Opportunity Commission. It is indeed a pleasure to appear before you again this year. As always, I thank you for your past and anticipated future support of EEOC.

Our mission is to ensure fair and inclusive workplaces so workers can compete on the basis of merit and pursue their individual versions of the American dream. To do this, we are continuously assessing the strategic focus of our enforcement litigation and federal programs. We also educate employees and job seekers from teens to retirees, as well as employers from small business owners to the largest corporations. I have submitted for the record a written statement that highlights specific aspects of the budget. But before answering questions I would like to just take a few minutes to highlight the issues and challenges we have faced since I last appeared before you.

First, I want to mention our workload. I note that our dedicated employees are challenged on a daily basis with a workload that is prodigious. In fiscal year 2007 we received almost 83,000 private sector charges, over 13,000 federal sector appeals and hearing requests, we filed 336 lawsuits, and we recovered close to $350 million in benefits for victims of discrimination. However, we still ended the year with an inventory of 54,000 charges. For those accomplishments I thank the dedicated employees at EEOC who have made all of this possible. They are our most valuable resource and I am proud to be a part of their team. Approval of our 2009 budget request, a $12.6 million increase over this year, will greatly assist us in managing our workload.

Next I want to call the Committee's attention to staffing. In 2007 we hired 172 new employees but this was just barely enough to match the number of separations. There was no net gain of employees last fiscal year because employees were retiring, transferring, and otherwise leaving as fast as the new employees were coming on board. The news is better for 2008. We have improved our hiring processes and as of today we have a net gain of forty-six new hires over separations. I am committed to backfilling front line positions as they become vacant, and as the budget permits. And I am always looking for dollars to ensure that we put the resources on the front line.

For fiscal year 2009, in addition to the backfills, we project 175 new hires, the vast majority of which will be for front line positions. Of the President's budget request, almost 75 percent will go to staffing. This will enable us to retain and hire the investigators, mediators, attorneys, and support staff that we need. The new hires are critical to reducing the rate of the inventory's increase.

Finally I want to note, as has been said, that the National Contact Center has met its demise. Having completed the hiring and training of our information intake representatives this past March, the customer response function is officially in-house. The full time trained, permanent, government employees work at fifteen of our district locations and they are now handling roughly 85,000 calls a month. The good news is that the fifty-five employee outsourced center has been abolished and the new internal, sixty-six federal employee customer response system is operational. The bad news is that this internal operation is costlier to operate.

In conclusion Mr. Chairman and Committee members, the charges that we receive are increasing nuanced and more complex. This requires refocusing and making a strategic alignment to enable the Commission to continue to be effective in this twenty-first century environment. The President's request for 2009 provides a significant increase and will allow us to continue our mission.

Thank you for inviting me to appear before you today. I am happy to answer any questions.

[Written statement of Naomi Churchill Earp, Chair, U.S. Equal Employment Opportunity Commission]

STATEMENT OF
NAOMI CHURCHILL EARP, CHAIR
U.S. EQUAL EMPLOYMENT OPPORTUNITY COMMISSION
BEFORE THE
SUBCOMMITTEE ON COMMERCE, JUSTICE, SCIENCE, THE JUDICIARY AND RELATED AGENCIES
COMMITTEE ON APPROPRIATIONS
U.S. HOUSE OF REPRESENTATIVES
APRIL 10, 2008

Good afternoon Mr. Chairman and Members of the Subcommittee. Thank you for inviting me to testify today on behalf of the Equal Employment Opportunity Commission (EEOC) in support of the President's fiscal year 2009 budget request of $341.9 million. I have now completed 20 months as the thirteenth Chair of the Equal Employment Opportunity Commission and it is a distinct pleasure to appear before you again this year. I am going to discuss our fiscal year (FY) 2009 needs as set forth in the President's request and highlight some of our activities since I last appeared before you. As always, I thank you for your past and anticipated future support of the EEOC.

The EEOC's mission and vision is to ensure the opportunity to compete on the basis of merit in fair and inclusive workplaces. It is our responsibility to enforce the applicable federal laws to protect against the pernicious effects of unlawful employment discrimination. We strive to resolve claims of discrimination efficiently and proficiently, and continuously assess the strategic focus of our enforcement, litigation, and federal programs. We are also proactive: we educate employees and jobseekers, from teens to retirees, as well as employers, from small business owners to the largest corporations, in order to promote harmonious workplaces for our citizens – free from discrimination.

As an enforcement agency, we must concentrate our efforts and our resources to achieve enforcement processes that are thorough, timely, and of high quality. To accomplish this, our goal is to manage our resources so that we are best able to fulfill our enforcement mandate. Mr. Chairman, before I discuss in greater detail our FY 2009 budget request, I would like to update the Subcommittee on some of the issues facing the Commission.

For several years, we have reported on our efforts to improve the Commission consistent with recommendations that the National Academy of Public Administration (NAPA) set forth in a 2003 study. For example, after two years, we are seeing positive returns from repositioning our field offices into 15 districts. However, after a two year pilot program that was extended by one year, we terminated the operation of our National Contact Center in December 2007. While I will address this issue in more detail later in my testimony, I can state that we have been able to bring our call response function in-house, and continue to work on solutions that will make the call response function as effectively and efficiently as possible given the Commission's decision.

Second, we are facing a rise in charge receipts and a growing inventory. We are managing our resources to increase the number of front line staff to address those realities. The President's budget request will enable us to hire investigators, mediators, attorneys, and support staff to meet those challenges.

Third, the type of charges we're receiving are changing, and are becoming more nuanced and complex. This requires refocusing and strategic alignment to enable the Commission to be as effective in the 21st century as it was in the 20th century. We will continue to review our operations and infrastructure to obtain savings wherever we can so that we make best use of our resources. The Commission received high marks for four consecutive years on its financial statements and we strive to allocate our resources where they are most needed while maintaining a sound financial model. This approach allows us to fulfill our vital mission and provide the best service to those we serve.

EEOC'S FY 2009 BUDGET REQUEST

EEOC's FY 2009 budget request is for $341.925 million, an increase of $12.625 million over our FY 2008 appropriation. As discussed below, its approval is essential to permit us to continue to fulfill our mission.

Staffing – Our budget request includes $256 million for compensation and benefits. In FY 2007 we were able to bring on board 172 new employees, which allowed us to keep up with the rate of separations – which also numbered 172. To this point in FY 2008 we have 129 new hires and 83 separations, for a net gain of 46. We also have an additional 65 positions budgeted, authorized, and in the process of being filled. The 2009 Budget provides resources for 2,556 full-time equivalent employees – 175 more FTE than the Commission will have in 2008. Of these additional staff, 109 are personnel to address the Commission's private-sector charge workload, and 66 are staff for the in-house customer response function.

Enforcement – Our budget request includes $176 million for administrative charge processing. Our employees are dedicated to their mission, which is demonstrated by the volume of work that the Commission produces. In FY 2007 the EEOC received 82,792 private sector charges, a 9 percent increase over 2006. We had 72,442 private sector resolutions and recovered $291million in monetary benefits that went directly to the victims of discrimination, an increase of 26 percent over FY 2006. We also increased the number of our mediation resolutions to 8,649, a 6 percent increase over FY 2006. Also in the private sector, during FY 2007, our litigation program filed 336 new merit lawsuits and resolved 365, resulting in monetary benefits of $55 million, an $11 million increase over FY 2006.

In FY 2007, our average processing time per private sector charge was 199 days, reflecting a slight increase over our 193 day average in FY 2006. Our end of year inventory of private sector charges increased to 54,970, a 35% increase over our FY 2006 inventory, and consistent with our prior budget projections. We project an inventory of in excess of 67,000 by the end of FY 2008 and 75,000 by the end FY 2009. This is due in part to the upward trend in charge receipts, although we expect that increased staffing will permit us to slow the rate of increase in inventory.

As we increase staff up to our budgeted levels in FY 2009, we expect a positive impact on our inventory. The President's request will provide needed support in our effort to reduce the inventory and our average charge processing time. We continue to have a substantial number of our staff who are, or will be, retirement-eligible. Thus, it is critical that we be funded at the requested level in order for us to meet the rising tide of charge receipts and inventory.

I am also submitting for the record a copy of EEOC's FY 2007 Performance and Accountability Report. The report provides in greater detail our performance and activities for the past year and is available at:
http://www.eeoc.gov/abouteeoc/plan/par/2007/index.html

Litigation – Our litigation program is a critical part of our enforcement strategy, and our goal is to use our litigation to attain the widest possible impact. We accomplish this by seeking relief for multiple individuals that is prospective, and which will have the broadest possible effect by preventing the recurrence of discrimination. A strong litigation program has other benefits as well. It assists us in achieving the early resolution of charges during the administrative enforcement process, and the publicity of high impact litigation and other cases serves to increase voluntary compliance with the laws we enforce.

The EEOC's FY 2009 budget request for litigation is $60 million (primarily salary and benefits), and includes $3.15 million in funds to provide direct support to our litigation program (such as costs of expert witnesses, depositions, and litigation travel). We again project a slight decrease in our suit filings for FY 2009, but we continue to see the demands on our staff and our resources increase. This is because of our ongoing efforts to use some of our funding in litigating larger and more complex cases involving systemic discrimination. While these cases are resource-intensive to litigate, they have great potential to pay enormous dividends in the long run. When we secure resolutions that bring about positive changes in the workplace, these changes benefit all employees, not just those receiving direct relief.

Systemic Program – The Commission began its Systemic Initiative in April 2006 with the unanimous approval of the recommendations of a task force led by Vice Chair Leslie Silverman. The task force was charged with developing a plan for modernizing and reinvigorating the agency's nationwide systemic program. With the passage of Title VII of the Civil Rights Act of 1964, as well as later amendments and litigation authority granted to EEOC, Congress recognized that employment discrimination cannot be eradicated without a focus on its systemic nature. A strong systemic program is crucial to the elimination of instances of pattern or practice, policy, and class discrimination which has a broad impact on an industry, profession, company or geographic location.

Following approval of the task force's recommendations, the agency's 15 district offices prepared plans for identifying, investigating, and litigating systemic cases, both within their jurisdictional areas and on a broader regional or nationwide basis. These plans were implemented in January 2007. They encompass enforcement actions under all of our statutes, seeking to eradicate newly emerging forms of race and sex discrimination, as well as age, national origin, and disability discrimination. We are carrying out these activities using a "national law firm model," as called for by the task force, staffing systemic lawsuits based on the needs of the case, rather than the office where the case arose. This is resulting in more efficient use of resources. District offices are improving how they work with each other, drawing on staff nationwide to obtain the necessary expertise for a particular case, and cultivating additional expertise nationwide by working in partnership on complex or large cases.

I am pleased to report that, as we shift our focus to more class and systemic cases, EEOC's enforcement and litigation activities in FY 2007 and FY 2008 to date have yielded positive results in a number of significant cases. While the EEOC's docket has always included class cases, our existing and newly filed cases have been integrated into the offices' systemic plans and prosecuted as part of this nationwide effort. In FY 2007, for example, we resolved 20 cases with at least 20 class members, while we resolved seven such cases in the previous fiscal year. We resolved four lawsuits with an estimated class size of more than 100 persons, whereas in the prior fiscal year, we had no resolutions with classes of that size.

In FY 2008 to date, more than $51 million has been recovered through three litigation settlements alone: *EEOC v. Walgreen Co.* (S.D. Ill.), a Title VII lawsuit alleging race discrimination against African Americans in assignment and promotion of retail managers and pharmacists, on behalf of a nationwide class estimated at 10,000 individuals; *EEOC v. B & H Foto & Electronics, Inc.*, (S.D.N.Y.), a Title VII lawsuit alleging national origin discrimination in wages, fringe benefits, and promotion of Hispanic warehouse employees; and *EEOC v. Sidley Austin, LLP* (N.D. Ill.), an ADEA lawsuit alleging age discrimination against certain law firm partners age 40 and older who were downgraded or expelled from partnership status.

ADR/Mediation – Our budget request includes $23 million for mediation. Since its inception, EEOC's mediation program has been highly successful in resolving charges of employment discrimination. In FY 2007 we attained a record number of resolutions through the mediation process – 8,649, with over $124 million in monetary benefits recovered. Participant confidence in our program remains high, with our FY 2007 figures reflecting that over 95% of all participants indicating that they would use our program in the future. The Commission continues its efforts to highlight the benefits of EEOC's mediation program and to expand charging party and respondent participation. We are particularly interested in increasing the number of employers who participate in our mediation program. We encourage employers to enter into Universal Agreements to

Mediate (UAMs). These agreements reflect the employer's commitment to using the mediation process to resolve charges. In FY 2007 we had a 15% increase in the number of UAMs, to 1,269.

Outreach – Our budget request includes $9 million for outreach. We educate employers and other members of the public about discrimination, including trends and issues that we have identified and cases the EEOC has handled. Field and Headquarters offices participated in 5,658 educational, training, and outreach events during FY 2007, reaching 278,803 persons. We recognize the educational and deterrent value of publicizing our court victories, particularly the cases resolving systemic discrimination, because of the ripple effect such decisions can have on promoting changes both across the impacted industry and in related industries. In addition, we issued 765 press releases on our enforcement activities to further raise public awareness and encourage compliance.

We will continue to promote voluntary compliance with the federal equal employment laws to prevent or reduce discriminatory barriers to employment opportunities, including the promotion of individual awareness and understanding of rights and responsibilities under those laws. Our outreach, education, and technical assistance programs seek to meet the needs of diverse audiences, and we will partner with the employer community and other stakeholders to foster strategies to recognize and prevent discrimination in the workplace. We will continue to provide guidance and information on employer "best practices" reflecting our strong interest in proactive prevention, and we will stay on the forefront in informing both employees and employers alike of their rights and responsibilities in the ever-changing workplace environment.

Initiatives – I have discussed the importance of our outreach programs, some of which are conducted through several targeted and ongoing initiatives. These initiatives have no separate funding component and are performed by all of our professional staff. Thus, they are included in our overall outreach, education and technical assistance budgets.

In an effort to identify and implement new strategies that will strengthen its enforcement of Title VII and advance the statutory right to a workplace free of race and color discrimination, EEOC unveiled the E-RACE (Eradicating Racism And Colorism in Employment) Initiative during its February 2007 Commission meeting. Through E-RACE, the EEOC identifies issues, criteria, and barriers that contribute to race and color discrimination and raise public awareness of race and color discrimination in employment.

Through our Youth @ Work Initiative, we educate students and young workers about their workplace rights and responsibilities. We reach out to schools and educators to share training materials and develop and present training to teenagers to assist these young workers as they enter and navigate through the workplace. We also provide training and information to businesses that employ young workers to encourage them to proactively address discrimination issues confronting young workers.

In the federal sector, the EEOC continues its LEAD (Leadership for the Employment of Americans with Disabilities) Initiative to address the declining number of employees with targeted disabilities in the federal workforce. This national outreach and education campaign includes seminars, educational events, and focus group sessions to explore the issue of declining employment for individuals with severe disabilities and identify concrete solutions to address the problem.

National Contact Center – I alluded to our National Contact Center earlier in my statement. An outgrowth of the NAPA recommendations, the National Contact Center began operation on a pilot basis in March 2005 under a contract to Pearson Government Solutions (later Vangent) from a facility in Lawrence, Kansas. The NCC allowed 24 hour access to the EEOC and the ability to speak with a live person 12 hours a day, five days a week. At its peak, the contact center was handling 77,559 inquiries per month - phone calls, e-mails, letters and faxes. In late 2007, the Commission voted to terminate the contact center and to replace it with an in-house customer response system.

Consistent with the Commission's decision, beginning in December 2007, we brought the customer response function in-house. The EEOC currently receives approximately 85,000 calls each month to our main toll-free public number. Since December 20, 2007, when the contractor-operated contact center ceased operation, English and Spanish language calls to the toll-free number have continued to be routed through a hosted Interactive Voice Response (IVR) system for initial resolution. The IVR allows the EEOC to be available to the public 24 hours a day – providing recorded information concerning the EEOC and the laws we enforce. The IVR is important because it resolves a substantial number of calls, thereby reducing the volume of calls being routed to EEOC field offices.

Between December 2007 and March 2008, calls were routed through the IVR to our 53 field offices. During this period, we relied on temporary employees to assist with answering calls. We have now completed the hiring and training of 61 Information Intake Representatives (IIRs) who started handling calls at 15 locations in our districts on March 17, 2008. These are full-time, trained, permanent government employees. We also have hired management staff with relevant experience to assist in the design and delivery of training and in the transition, implementation, and support of the customer response operation across the 15 EEOC districts. The customer response management staff will work closely with the IIRs to help them utilize a web-hosted knowledge base and customer relations management system for access to scripts as well as recording and reporting of caller information. A management team of five District Directors has been established to develop the management plan and performance expectations for the customer response team.

We issued a solicitation last week for long-term technology support to allow for full-service implementation and operation of the in-house call-answering/customer response activity. Currently the in-house activity uses only the IVR and a web-hosted knowledge-base software program to facilitate call handling. The full-service technology support will include automatic call distribution, skills routing, computer-telephony integration and remote quality assurance monitoring. We expect to complete the contract award by the end of September 2008 and to have fully functional technical support in place by early February 2009.

Federal Sector – Our budget request includes $47.5 million for our federal sector programs. In the federal sector, EEOC has responsibility for hearings and appeals of complaints filed by federal employees and applicants for employment. Our hearings data shows that we received 7,869 hearing requests, had 7,163 resolutions, ended the year with an inventory of 5,505 and had an average processing time of 248 days. Both the number of hearing requests and end of year pending hearings reflect increases over FY 2006. In the area of federal sector appeals, we received 5,226 appeals, resolved 5,617, and ended the year with an inventory of 3,496. The average processing time was 230 days for FY 2007. These numbers reflect decreases in all areas, except for a 10 day increase in average processing time.

In addition we exercise our oversight authority by providing guidance, outreach, and technical assistance. The Federal Sector complaint process is one that we are constantly evaluating with a view toward improvements, regulatory and otherwise. We are currently working on several sets of recommendations concerning our regulations, the investigative process, and the organizational structure of our Administrative Judges.

The Commission has championed an approach toward creating a barrier-free, level playing field throughout the federal government. This approach was captured in the landmark EEOC MD-715, which was unanimously approved by the Commission and became effective government-wide on October 1, 2003. MD-715 is the roadmap for agencies to identify and remove barriers to equality of employment opportunity so that the American people can have a model federal work force which fully reflects everyone's contributions. Using the guidance and principles contained in MD-715, we now have an effective tool for evaluating agencies' progress in creating effective equal employment opportunity programs and monitoring plans submitted by agencies to identify and remove barriers to free and open competition in the workplace. To assist agencies in reporting under MD-715 we provide tools and assistance to agencies to help them analyze their work forces and uncover barriers to equal employment opportunities. Once barriers are identified by agencies, EEOC staff collaborates with them to develop creative strategies to eliminate or reduce the impact of obstacles identified.

One of the most important mechanisms in our federal sector program has been our authority to conduct evaluations of federal agency EEO programs. To better implement the Commission's focus on establishing effective relationships with Federal employers, we have conducted assessments to assist agencies in establishing model EEO programs and issued government-wide reports concerning a wide range of federal sector EEO topics.

Fair Employment Practices Agencies – We continue to work in partnership with Fair Employment Practices Agencies (FEPAs) and Tribal Employment Rights Organizations (TEROs). Our budget request provides for an amount for state and local contracts up to $26 million. The Commission approved designation of two new FEPAs during fiscal year 2008. The Erie County (Pennsylvania) Human Relations Commission and the Guam Department of Labor will provide services in areas that are currently underserved. The Commission is also working with the FEPAs to develop a method for measuring their contribution to EEOC's goals and objectives. During fiscal year 2007, there were also partnerships formed between EEOC and FEPAs to provide outreach and training opportunities for some of the TEROs. The FEPAs also join with EEOC field staff to develop and deliver joint outreach and education activities to employees and employers regarding their rights and responsibilities under both federal and state or local laws.

Information Technology – We continuously assess our Information Technology (IT) architecture and services to improve operational efficiency, lower recurring costs, increase customer satisfaction, and ensure that IT services are properly aligned with agency priorities and strategic plans. We developed and initiated the implementation of a "New Vision for IT" which focuses on the areas of IT architecture, customer service, knowledge management, internal operations, and communications/collaboration. The overall goal is a more efficient usage of our IT resources while realigning our architecture and services to better support an environment that promotes collaboration, data integration, enhanced communications, and streamlined work processes.

We have improved data analysis and integrity by integrating employer data collected by our EEO-1 Reporting System with the private sector charge data collected in our Integrated Mission System (IMS). As a result, EEOC is able to link employer EEO-1 statistics with our repository of employment discrimination charges, to assist in our systemic investigation efforts. We also incorporated the Federal Appeals process and data into the IMS, thereby integrating data and retiring the stand-alone legacy system. EEOC additionally implemented a new document management-based "Case Management System" to provide cross-office collaboration, project management and electronic file sharing for agency litigation functions. EEOC is currently preparing to pilot a similar document repository for our Administrative Judges. To advance our technological infrastructure, we replaced all of our field offices' personal desktop computers with securely configured laptops and docking stations, thereby improving our telework capabilities and pandemic preparedness. We also continued our expanded usage of video streaming and video conferencing.

Our FY 2009 proposed IT budget reflects a slight increase of $580,000 over our FY 2008 budget. For the balance of FY 2008 and for FY 2009, our focus will be on maintaining our current IT infrastructure and implementing mandatory new initiatives such as smartcard (ID) requirements. We will continue to develop business cases on key technology initiatives.

Headquarters Relocation – Rising rent at our L Street location, as well as a reduction in our Headquarters workforce, precipitated our decision to relocate from our current Headquarters location to One NoMA Station, 131 M Street, N.E., in October 2008. In addition, our Washington Field Office will be included in the relocation to

NoMA in the fall. We are well down the road in our preparations for the move to our new location. The Federal Protective Service of the Department of Homeland Security (DHS) completed a building security assessment in June 2007. Based on tenant population, square footage, and special security concerns, DHS has classified EEOC's new HQ building as a "Level IV" facility. We estimate the security costs will increase by $1 million to comply with all "Level IV" requirements at our new location.

Conclusion

In conclusion, Mr. Chairman, the President's request for FY 2009 provides for a significant increase and will allow us to continue our mission. In a workforce that is increasingly more diverse and global in nature, the dedicated staff of the EEOC works hard, every day, to ensure that the American public has the freedom to compete, advance, and succeed on the job.

Mr. Chairman, approval of this budget request is essential, and we appreciate your support and that of the Subcommittee. Thank you for inviting me to appear before you today and I will be happy to answer any questions you might have.

BACKLOG REDUCTION

Mr. MOLLOHAN. Thank you, Ms. Earp. EEOC's charges pending at the end of the year have been increasing consistently over the last few years. The backlog reached nearly 40,000 at the end of 2006, which was a 19 percent increase over the previous year, and the backlog grew in 2007 to 54,970, a 38 percent increase. The backlog is projected to grow to 75,000 in 2009. I understand that according to a presentation that you made to some stakeholders, you think it might go to as much as 100,000 in 2010. Is that correct?

Ms. EARP. Yes.

Mr. MOLLOHAN. I mean, that is really unacceptable. You are projecting 109 new personnel, and I commend you for having an increased budget request. I do not know how you were able to do that, but there is a lot of people that testified here before you that I am sure are envious. But is that adequate? If 109 new personnel can only slow the growth of the backlog are we doing what we should do? And what would it take to begin erasing this backlog?

Ms. EARP. Mr. Chairman, EEOC's financial issues are very, very longstanding. They go across a number of administrations. We are pleased with the President's 2009 budget because it is a beginning to address, in our base, issues that have been so longstanding. We need the front line employees. During the same period of time that you mentioned when charges were increasing anywhere from 19 to 34 percent, investigators were decreasing anywhere from 3 to 10 percent. So we feel very pleased that we are an agency with an increase this year while so many others are actually being cut.

Mr. MOLLOHAN. Okay. Well, I wanted a little more on that. What do you think we would have to do in order to reduce these backlogs and begin a downward trend in real terms?

Ms. EARP. We need——

Mr. MOLLOHAN. You are estimating that the percentage of charges you will resolve within 180 days will jump from 56 percent in 2007 to 73 percent in 2008 and to 75 percent in 2009. Are those realistic?

Ms. EARP. They are the best projections that we could put together given the number of people that we have and the anticipated workload.

Mr. MOLLOHAN. Are they realistic?

Ms. EARP. Fairly realistic.

Mr. MOLLOHAN. Okay. Have you done a mid-year review for 2008?

Ms. EARP. Yes.

Mr. MOLLOHAN. Are you reducing at the rate of 73 percent for the first six months of 2008? Or however many months we are into 2008?

Ms. EARP. Not quite. But at this point in 2008 we have a net gain of forty-five employees, the vast majority of which are front line employees. So there are investigators at the point where charges and receipts come in.

Mr. MOLLOHAN. What is your point?

Ms. EARP. The point is, last year we did not have a net gain at all. This year up to this point we have——

Mr. MOLLOHAN. You did not have a net gain?

Ms. EARP. In employees for 2007.

Mr. MOLLOHAN. Oh, oh, okay, sure.

Ms. EARP. So we feel we are a bit ahead.

Mr. MOLLOHAN. But what I was asking was, what is your midyear experience? You are estimating that your charges resolved within 180 days will jump to 73 percent in 2008. And this is just one measure, I guess. But my question is, have you done a midyear review to test that against real experience?

Ms. EARP. May I provide the——

Mr. MOLLOHAN. Oh sure. Absolutely.

Ms. EARP [continuing]. Written information for the record.

Mr. MOLLOHAN. Oh, for the record. Okay. If you have to, yes.

Ms. EARP. Yes. I do not have that data at my fingertips.

Mr. MOLLOHAN. Well, I have got it here so I am ahead of you. I just cannot interpret it immediately. Well, I guess I would suggest that if the numbers do not prove themselves out that those are rosy projections. I will tell you what the Committee would like to have, but I imagine you will need to spend some time with this and can only submit it for the record. We would like to know not what you have requested but what you would have to request in order to reverse this unacceptable trend line. And obviously you are not going to do that in a year.

Ms. EARP. Right.

Mr. MOLLOHAN. But in some acceptable period of time, which I leave you to select. Would you do that for the record?

Ms. EARP. Yes, sir.

[The information follows:]

WORKLOAD MANAGEMENT

The percentage of charges that will be resolved within 180 days is a strategic goal and we are devoting our resources and energies to try to achieve it. At midyear, of the 34,636 resolutions, 17,853 (51.5%) were resolved within 180 days. We also know that the average processing time for resolutions at midyear is 206 days, which would indicate that the inventory continues to be an issue in resolving charges within 180 days. Our budget request for 2009 brings us a step closer towards meeting that strategic goal.

Mr. MOLLOHAN. What it would take. What is the number of employees and what positions, and can you associate that with a dollar amount. I am going to yield to Mr. Frelinghuysen at this time.

Mr. FRELINGHUYSEN. Why are you anticipating such a dramatic growth in the backlog?

Ms. EARP. Primarily it has to do with the attrition of staff.

Mr. FRELINGHUYSEN. So staff? Disassemble the backlog for me. How many of these cases have been pending for two years? Three years? Or are there some that have been hanging around the EEOC for years without resolution?

Ms. EARP. Yes. I can provide specific data for you for the record. But we know that we have some aged cases. The work that EEOC does is very labor intensive. The backlog, well actually the inventory, does not mean that the case is not being worked. It means it has worked through various phases as it makes its way from intake to whether or not we are going to litigate it. A lack of resources at any point along the continuum slows the process, and we have had a lack of investigators to complete investigations of cases in the inventory.

[The information follows:]

AGE OF PENDING INVENTORY

EEOC has been vigilant in attempting to ensure that charges are resolved as quickly as possible. EEOC field offices have continued to focus on charges more than one year old to ensure that they are promptly addressed. Of the more than 72,000 charges in our inventory at midyear, 1,636 were two years old or older. Of the 1,636 charges two years old or older, 532 were three years old or older. Our data system tells us that 50% of the charges two or more years old are prioritized under processing as "A" charges and are likely in extended investigation or conciliation between EEOC, the employer and the employee. For those charges three years old or older, 70% are prioritized as "A" and are in extended processing.

Mr. FRELINGHUYSEN. Well, the backlog seems to be exploding. But I always thought the phrase "justice delayed is justice denied," surely you are working on some of the older ones first?

Ms. EARP. Yes. We prioritize the aged cases.

Mr. FRELINGHUYSEN. So how many aged cases are there? Do they go back five years? Or? And do some of these parties give up? I mean, what happens? After a while here I would assume a lot of people say, "Well, you know, we are not getting any resolution here."

Ms. EARP. The best information that I have today is the average age of our charges is about 209 days. And the short answer to your question is, yes, when we are unable to investigate in a timely manner we lose witnesses, we sometimes lose charging parties. Yes, people do eventually sometimes give up.

Mr. FRELINGHUYSEN. The 109 new investigators, attorneys and support staff, is it your intent that all of those new positions will be working on the private sector enforcement?

Ms. EARP. The vast majority of the President's increase, roughly 90 percent of those funds, will go to staff and staff related expenses.

Mr. FRELINGHUYSEN. The EEOC has been working in these areas for years.

Ms. EARP. Yes, sir.

Mr. FRELINGHUYSEN. And I do not mean to be insulting, but obviously I assume there is a fair amount of the same sort of charges and issues. Some have a far greater degree of complexity than others. After a while, there must be some recognized ways that in some cases you could expedite some and perhaps because of the complexity, or lack of staff, you could not expedite others. I just wonder whether you had tried to introduce some more efficiencies, either through the use of different or new technologies. I know that your budget document mentions a cost/benefit analysis that shows that the EEOC could achieve efficiency savings of $15 million if you implemented a document management system agency wide.

Ms. EARP. We are working on that.

Mr. FRELINGHUYSEN. So what exists now? Is it all hard copy or carbon paper? Or is there some degree of, what is it? Are you online?

Ms. EARP. Quite a bit of what we do is online. Our document management posture is uneven. Because when you are an agency that is resource intensive, where the majority of the funds go to paying staff salaries, it really leaves very little for the kind of technological advancements and advanced planning that is necessary. But in the last couple of years we have been able to realize efficiencies through the use of the web, the internet, and various technological support, especially to our legal staff.

MEDIATION

Mr. FRELINGHUYSEN. And lastly, I am not a lawyer but I do have a huge admiration for people who spend a good portion of their lives on mediation. You know, there is a possibility of intervention. Where is that in the overall scheme of things?

Ms. EARP. Mediation remains a centerpiece of what we do and is one of the truly good news success stories that EEOC has to tell.

Mr. FRELINGHUYSEN. But as I look at some of your budget materials, the number of charges being resolved through mediation apparently is dropping. Is that accurate?

Ms. EARP. It is. It has to do with the fact that we have both mediators who are federal employees on our staff, as well as contract mediators in various places around the country. And we have not had contract dollars. We also have not had as many pro bono mediators as in the past.

Mr. FRELINGHUYSEN. We have through the doors here the Legal Services Corporation. And they promote the idea, which I think we are enormously sympathetic for, that members of the Bar ought to be doing more. Certainly in my neck of the woods there are more law firms, maybe it is just a great place to practice law. But you would like to see a few more law firms stepping up to the plate in terms of participating. I do not mean to get off track here. I think mediation is a good thing in a lot of different legal arenas.

Ms. EARP. I agree.

Mr. FRELINGHUYSEN. Thank you for the time, Mr. Chairman.

Mr. MOLLOHAN. Okay, thank you. Let me follow up on that line of questioning that I had before. I think I understand these numbers a little bit better, partially based on your testimony just a moment ago. Let us help you in this process by your identifying what I would like to get at the end, identifying the responsibilities, the jobs, that need to be increased and where they are, if you will cite them in light of this information. These statistics would suggest that you had pending at the end of February 2007, 45,671 charges. At the end of February 2008 you had pending 70,209 charges. If that is correct, in one year you would have a 53.7 percent increase in pending charges. Are those statistics accurate?

Ms. EARP. Those statistics sound somewhat flawed. The largest single increase that I am aware of is somewhere between about 25 and 30 percent. And that would not have been between 2006 and 2007 where we realized——

Mr. MOLLOHAN. No, between 2007 and 2008. Did I say 2006 and 2007? I meant February of 2007 and February of 2008. This would be a mid-year snapshot. Would you be able to turn around and answer this question by consulting with your staff? And if so, would you please do it?

Ms. EARP. My Program Director says she believes that data is accurate. But that by the end of the year that number will have dropped significantly as we close cases by the end of the fiscal year.

Mr. MOLLOHAN. Okay. Well I hope that is true. But right now those are accurate. We want to help you achieve that goal. That is why we are going through this exercise, for no other reason. The average age of the charges in days was 189 days in February of 2007. February of 2008, the average age of those charges is 211 days, a 22-day increase. So it is taking you longer this year rather than shorter compared to 2007. You had received, in February 2007, 30,775 charge receipts. In February of 2008, 40,328, a 31-percent increase. So you are receiving more charges. Something is going on out there. Your resolutions, in February of 2007 were 27,433. In February of 2008 you had 27,516 resolutions, a .3-percent increase. But it is taking you 18 days longer. I just cite those last statistics to round this out. This is not a good picture. So we need to address this.

Since 2001 you have lost over one-quarter of your employees and your charges are increasing. So it is no wonder that you are having this very unfortunate trend line. You are about 200 FTE below your ceiling right now. The Inspector General has declared "it is imperative that senior level management place greater emphasis on the human capital condition at EEOC." Do you agree with that?

Ms. EARP. Yes.

Mr. MOLLOHAN. Are you doing that?

Ms. EARP. Yes.

Mr. MOLLOHAN. How are you doing that?

Ms. EARP. We are working on a Human Capital Plan. We need to make sure we have the right positions at the right grade with the right skills.

Mr. MOLLOHAN. And the right number.

Ms. EARP. And the right number.

BUDGET REQUEST

Mr. MOLLOHAN. Well, does your budget request provide sufficient funding to hire those 200 already short FTEs in the fiscal year 2008 staffing ceiling, in addition to the 175 new FTEs you are requesting?

Ms. EARP. No, sir. It does not. The gap between——

Mr. MOLLOHAN. What does your funding request allow you to do then? Just hire the 175?

Ms. EARP. The 175.

Mr. MOLLOHAN. So you are still going to be short 25 for this fiscal year. So how many employees and in what positions would you have to hire to reduce this trend line?

Ms. EARP. That is the information that I am going to be very happy to provide to you?

IN-HOUSE CALL CENTER

Mr. MOLLOHAN. For the record, all right. Now, let me ask you one other question. I am going to get deeper into this but I want to go to Mr. Honda here in a second. What relationship is there between the quality and quantity of the intake personnel that you are in the process of hiring because you are taking the call center in-house and a resolution of these cases? My thinking is that if you had a capability at that initial contact point, that you might be able to resolve cases at that point, or shortly thereafter. That may be all wrong. It just seems logical to me that you could because I have heard, I must tell you, that the folks being hired at those positions are pretty entry level, minimally credentialed people. So I am just wondering if it would be possible to resolve some of these cases with higher credentialed people at the contact point, and help in that way to reduce this backlog?

Ms. EARP. Theoretically, I think so. In an ideal world, if we had intake being performed by attorneys or highly skilled investigators, sure. Because they understand the law and they more quickly would be able to apply the law to the set of facts that the charging party is explaining. But that is a very, very expensive proposition. For the people that we are currently hiring, I think over time they can be trained to add additional value. Right now we are just making sure that we get the charge in and that we understand what is being alleged. After the employees have been with us for a while and better understand the process that they are helping to administer, I think we will get more value.

Mr. MOLLOHAN. Well, that suggests a number of other questions to me which I will ask in another round. Thank you. Mr. Honda.

SUCCESSION AND TRANSITION PLANNING

Mr. HONDA. Thank you, Mr. Chairman. And welcome. I understand that a question has already been asked regarding the workload and shrinking workforce. But I was wondering whether there has been any planning on succession on those slots that have been vacated or within the Department, whether there is a succession planning that you have created or implemented? And if so, what does it look like in terms of demographics and language abilities?

Ms. EARP. We do not have at this point what I would describe as a fully fleshed out succession planning system. We have a strategic human capital plan that we are working on which will include provisions for succession planning. And it is anticipated that the succession planning will take into account how diverse America has become, and the changes that we see in our charge receipts.

Mr. HONDA. And with the changes that have occurred, the increasing diversity what would you consider some of the characteristics of an employee that should be embedded in that person in order to reflect or deal with the change in the population?

Ms. EARP. Well, clearly employees who are multilingual would be an important skill to have. But also employees who are more analytical, who have some understanding of statistics. There are a number of skills that we would consider for the 21st century that perhaps were less important in our old case work.

Mr. HONDA. Would you submit for the record a list of the permanent hires made since 2006, including the date of hire, the position for which they were hired, and the position they currently hold, and a description of their positions, and the office to which they were assigned?

I have a question, Mr. Chairman, and I am not sure if it is pertinent for this hearing but since it is EEOC and it is a question that probably applies to general practices across the board during the time of change, and if I may ask the question. During this time of change, there may be some shifting of personnel across the board in the capital. And I have always had a concern that some folks may be placed in one position over another in another position over someone who has been waiting for a promotion. Coming from another department, if they are favored by the person who has more control over personnel. Is that something that one watches out for and monitors or looks at when new hires, what positions will be moved around? That kind of, for lack of a better word, cronyism is avoided?

Ms. EARP. I am not sure I completely understand the question. But I would——

Mr. HONDA. I will be more blunt then.

Ms. EARP. Okay.

Mr. HONDA. In a time of change, some people will be placed in positions over other people by a political appointee before they leave.

Ms. EARP. We do not have any burrowing going on at EEOC. We do not have, the only political staff at EEOC are the Commissioners, the Legal Counsel, the General Counsel, and the Legislative Director. Those are the only ones. And the Office of Personnel Management has been very clear by directive about positions happening between now and next November, and that they have to be vetted by OPM. So I think that we are pretty vigilant and we are on guard for making sure that our career employees——

Mr. HONDA. That is a better word.

Ms. EARP. If there are positions to be filled, that they are the ones that get them.

Mr. HONDA. And I did not mean for the question to be directed towards EEOC. But EEOC's function, I thought, might also extend into other practices in other departments. And there is some sort of watch dog implemented, such as the one you described for your department.

Ms. EARP. No. Other than having watch dog responsibilities for diversity and equal opportunity, we do not look specifically at what is transpiring during a transition period.

Mr. HONDA. Okay. Do you have a suggestion where that might be, that question might be placed?

Ms. EARP. Well, both the Merit Systems Protection Board and the Office of Personnel Management have responsibility for nonmeritorious promotions or hires.

Mr. HONDA. Okay. Very good. Thank you very much.

Ms. EARP. Thank you.

Mr. HONDA. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Okay. Mr. Frelinghuysen?

Mr. FRELINGHUYSEN. Could you tell me, of the charges that are brought, obviously a number are resolved but obviously you have not been able to resolve too many because you lack staff. A number are pending and those figures are escalating. What would be your make up of those charges? Let us take age, race, sex discrimination, national origin, issues related to people with disabilities. Could you just give us a general run down?

Ms. EARP. Yes. Roughly——

Mr. FRELINGHUYSEN. And is there sort of a history relative to any of those categories? And I do not mean to be saying that those are the only ones you deal with, are historically issues that relate to one of those areas more prevalent in the pending category?

Ms. EARP. I think that our inventory is probably pretty consistent with the level of charge receipts on various bases. Historically, race is the number one charge filing that we receive and race normally accounts for somewhere between about 30, 35, 37 percent. Usually the number two category is gender, including sex discrimination, pregnancy discrimination, those kind of things. Number three can fluctuate but most recently it is retaliation. In fact, depending on how you slice the data, retaliation might actually be the number two basis. And then disability and age and national origin typically come in somewhere around 10 to 15 percent or less. But race and gender tend to be number one and number two.

Mr. FRELINGHUYSEN. Do you have case managers? Obviously, you have some people with more institutional memory and experience than others. Are people assigned that have a wealth of experience in a certain area to work on those cases? How does it work actually? Do those that work on behalf, on your behalf, do they own these cases until they are resolved? How would you characterize your workforce? Do they own these cases until they are resolved?

Ms. EARP. A single individual, I cannot say——

Mr. FRELINGHUYSEN. I know you get input from all sorts of people, obviously, if certain people are doing investigatory work and——

Ms. EARP. Right.

Mr. FRELINGHUYSEN. Doing all the things that are necessary.

Ms. EARP. Well first of all, we try to pair our staff so that more junior staff gets the benefit of being mentored and trained and monitored by more senior staff. The best example of that is the way we are approaching systemic litigation and investigation where we are teaming those staff that have a lot of experience with the less experienced, more junior staff. But the complaint, the charge is owned on a continuum by the staff assigned to that particular process. In intake the intake staff takes care of it. They own it. They do everything they have to do with it. Then the investigator has it. Then it may go to a mediator. And certainly when it gets to legal, legal owns it, and becomes very passionate about it.

Mr. FRELINGHUYSEN. So they own it——

Ms. EARP. On a continuum it is owned by staff with various expertise.

Mr. FRELINGHUYSEN. When the National Contact Center ceased operations in December their work was brought in-house.

Ms. EARP. Yes, sir.

Mr. FRELINGHUYSEN. So these people would be classified as intake?

Ms. EARP. Yes.

Mr. FRELINGHUYSEN. And those intake workers are in the 15 offices around the country, is that right?

Ms. EARP. Yes.

CALL CENTER

Mr. FRELINGHUYSEN. Last year you submitted for the record that bringing the function in-house would involve one time costs, I think you mentioned of $2.3 million, and additional costs of $3.5 million. Do those estimates still hold?

Ms. EARP. Pretty much.

Mr. FRELINGHUYSEN. Have there been any benefits in terms of overall efficiency and customer satisfaction, not forgetting the fact that there is this enormous backlog? Has there been any positive reaction to the new, to doing things the way that they historically had been done before the National Contact Center was set up?

Ms. EARP. Well, we hired the customer intake representatives just last March. So it is still a pretty new function for us. But it is up and running. We will have customer satisfaction surveys in fairly short order to send out so that we can do some comparison. But at this point, I would basically say we are performing the intake function and responding to the public. And we will get better at it.

Mr. FRELINGHUYSEN. And how would you define repositioning?

Ms. EARP. We basically collapsed our field structure from twenty-three district offices to fifteen. That allowed us to save by not having to hire twenty-three executives, hire fifteen instead. And it also gives better management control.

Mr. FRELINGHUYSEN. Has it?

Ms. EARP. Yes, I would say so.

Mr. FRELINGHUYSEN. Okay. Thank you, Mr. Chairman.

STAFFING ISSUES

Mr. MOLLOHAN. Thank you. I would like to follow up a little bit on the staffing issues which really are going to have to be addressed if EEOC is going to do its job. You are going to have to have better staff and they are going to have to be qualified staff. Looking at your pending retirement eligibilities, I note that the IG report found that 42 percent of EEOC employees will be eligible to retire between 2007 and 2012. That includes 46 percent of the investigators, which is a huge number, and 24 percent of the attorneys, which is a large number. So talking a little bit about your succession plan, tell us how you are now thinking and those in your organization who are thinking about this, how are you planning for succession?

Ms. EARP. We are working on a human capital plan which will take into account the fact that so many of our employees over the next five years are retirement eligible. The most important thing, especially for attorneys and for investigators, is to make sure we have the right number of people in the right places at the right grade level. Part of our inability to fund all of the positions that we have has to do with unfunded promotions and just structural deficiencies. A big centerpiece of our Human Capital Plan will be position management.

Mr. MOLLOHAN. Unfunded promotions means you cannot promote. Or if you do, you tell the people, “Great you are getting a promotion but we are not able to fund it. Therefore you are not receiving any more salary.” Is that right?

Ms. EARP. Well basically we have professional staff but we just do not have the dollars. If you hire someone at the GS–12 level and the only budget you have is for a GS–12, if there is an across the board cost of living adjustment, increase in benefits, promotion, we have to take that money from somewhere in order to fund it. So usually we would take it from a vacancy.

Mr. MOLLOHAN. Thank you. So does this year's budget request address those concerns and those short fundings?

Ms. EARP. Modestly. But you have already indicated the problem, and the problem is the gap between our ceiling and what we can really afford.

Mr. MOLLOHAN. I see.

Ms. EARP. The plan that I will give you proposes to close that gap. This is a structural problem that we have lived with probably for twenty years.

Mr. MOLLOHAN. When will you be able to get that plan up to this Committee? How long will it take you to do that?

Ms. EARP. My Budget Director thinks about a week, maybe two.

Mr. MOLLOHAN. Okay. Does your Budget Director have that in his head? Okay, but you are going to pull it together and get it up here within a week? All right. Just sharing some ideas. You are hiring x number of people to bring the call center in-house.

Ms. EARP. Yes.

Mr. MOLLOHAN. How many offices do you have across the country?

Ms. EARP. Fifty-three.

Mr. MOLLOHAN. Fifty-three. Are you going to hire an intake person, that is a person who will be replacing the responsibilities of the call center, in every one of the fifty-three offices?

Ms. EARP. No, fifteen.

Mr. MOLLOHAN. Okay, I thought I heard that. So you are only going to have those in fifteen offices?

Ms. EARP. Yes.

Mr. MOLLOHAN. And how many people will that be in each of the fifteen offices?

Ms. EARP. It varies by the size of the district, but we are hiring sixty-six total, which includes sixty-one to actually answer the phone and the rest are either tech support or supervisors.

Mr. MOLLOHAN. I see. And the places you think you are saving is on the supervisors and the tech support, I guess?

Ms. EARP. Yes.

Mr. MOLLOHAN. This is a huge attrition due to retirement. I think it is. I am just wondering if it would not be a good idea to hire, going back to my previous questions, people who are credentialed higher than you would normally think of hiring for an intake person, and look to move those people into investigators and attorneys positions. See, that would be a terrific training ground to move people in. Then you would ask for budgets to support them.

Ms. EARP. Well, I would note that while 40 percent of our employees are eligible to retire over the next five years, the fact is EEOC's employees stay on average six to eight years beyond retirement eligibility. So those employees who are eligible to retire, we still believe that for most of them the exit will be a lot slower.

Mr. MOLLOHAN. So that is about 20 percent?

Ms. EARP. It is about 19 percent a year actually eligible to leave.

Mr. MOLLOHAN. All right, well whatever those numbers are I just think that would be a good way to get talent into the entry level of your organization. When they were hired, if they are interested in this kind of work, and people who are interested in it are passionate about it, then they know that, wow, there is an opportunity for advancement. Again this is off the top of my head and I am not doing anything but sharing thoughts with you.

But I will say this. This cannot fail. With these backlog rates, and we are going to do our very best to look at funding and be responsive to these numbers you come up with, you cannot fail here. If hiring people at these fifteen offices does not work, that is a bad thing. So you need to be really carefully looking at the successful transition of the call center to the in-house function. I respect totally that you live with this every day. We are going to be making judgments after the fact, which is always easier to do. But because of your expertise you are in a better position to make these judgments prospectively. But you cannot fail in this. We have backlogs here. This is the United States of America and this backlog record from 2001 is abysmal. We have all talked about that and you totally agree with it. We are agreeing together here, and I am sure most people sitting here also agree. This Committee wants to support you. So we need to know what to do.

If only putting people in fifteen of these call centers is not good enough then you need to rethink it. If it is, that is great. If bringing people in who are more credentialed into these entry level positions, opportunity made available because you are bringing the call center activity in-house, I think, just off the top of my head that sounds like a great strategy. I think you need to do a cost benefit analysis regarding the various levels of expertise that can handle your intake. In other words, if you bring somebody into these call center positions or these entry level contract positions that is a little higher credentialed, that is a great training ground. They are going to move up and they can resolve cases. But what is the rate, and is there an opportunity to help reduce the backlog and to resolve charges at the entry point if there are people handling those entry level calls that have greater capability? Or greater experience, however you want to say that? That would be kind of a cost benefit. Maybe you pay a little more money for them, but you resolve more cases. I assume even somebody taking a call right now with the entry level people you are hiring can resolve some of these cases——

Ms. EARP. Mm-hmm.

Mr. MOLLOHAN [continuing]. Probably, just by giving them information, right? So that is more of a speech, but do you have any thoughts to express on that?

Ms. EARP. I would just like to underscore how pleased we are to have the $12 million increase and the opportunity to begin to address some of these structural issues. It is absolutely imperative that EEOC have a human capital plan that includes position management. I would agree with you that we need to refine exactly what skill at what level is needed along the continuum.

Mr. MOLLOHAN. Yes.

Ms. EARP. Maybe for the most complex, the most nuanced charges, having a front line staff doing intake that is highly skilled and therefore expensive in some small number of cases is the way to go. But for 60 percent, perhaps, of the people who call, perhaps we would not want to spend more than what we are already investing. But I am very happy to continue to explore that and to provide for the record some thoughts on how to close the gap in our funding.

Mr. MOLLOHAN. Well again, nothing I have said is a judgment about this. I am in a poor position to make those judgments. You are in an excellent position with this good staff behind you to make those judgments. But I do think I am correct in looking at the number of folks that at least are eligible to retire and the fact that you are increasing the number. You can look at all this as an opportunity. You know, you need to do it right. And hopefully you really are and I know you are trying. Mr. Frelinghuysen.

KNOWLEDGE MANAGEMENT

Mr. FRELINGHUYSEN. According to your budget document, and I quote, "to move towards the vision of knowledge management, EEOC obtained external expert resources to conduct a knowledge management study, et cetera, et cetera, et cetera." Where is that study?

Ms. EARP. Well, we are actually implementing some of it with the in-house call center. To make sure that the people on the front line have the appropriate understanding of civil rights law to be able to vet the questions and respond to callers in an effective way.

Mr. FRELINGHUYSEN. Well, it is more than that though, is it not?

Ms. EARP. Yes.

Mr. FRELINGHUYSEN. And it falls under the title of information technology, employing the latest technology.

Ms. EARP. Yes.

Mr. FRELINGHUYSEN. The gathering of statistics, of data, and drawing some conclusions from that data. So it is more than reinvigorating or educating the intake workers that are now back in the fifteen different centers.

Ms. EARP. Well, in the sense that the technology is used to give the intake workers scripts and scenarios that allow them to immediately look to see is the caller stating a fact pattern, that more easily guides the intake worker to what the answer is. It is putting the knowledge in an easily accessible way through technology.

Mr. FRELINGHUYSEN. You completed this analysis in 2007?

Ms. EARP. Yes.

OUTREACH

Mr. FRELINGHUYSEN. My last question. In terms of outreach and education, wherever I go, whatever office I visit, prominently there is usually some poster which has the EEOC. While people may get it, some sort of ignore it because it is on the wall for a long time. However, it is a viable document. How would you characterize your outreach? In other words, some things are so innate and so abominable. But in many ways you are proactive on the prevention side of things here. There is a certain maturity out there, but in some cases, you are reinforcing things which are so basic, so obvious, so human. How are you doing your outreach? How would you characterize your outreach these days?

Ms. EARP. We would characterize our outreach as highly effective and a contributing factor in the rising receipts.

Mr. FRELINGHUYSEN. Good. Thank you, Mr. Chairman.

STATE AND LOCAL ASSISTANCE

Mr. MOLLOHAN. Thank you. Your fiscal year 2009 request contains a reduction in EEOC's support to state and local Fair Employment Practice Agencies and Tribal Employment Rights Organizations. At the requested level you will reimburse the FEPAs and the TEROs about $26 million in 2009, which is $3 million less than you reimbursed them for, or are planning to reimburse, in fiscal year 2008. What is the justification for this reduction in state and local assistance?

Ms. EARP. The workload.

Mr. MOLLOHAN. Has gone down?

Ms. EARP. For the state and local agencies, yes.

Mr. MOLLOHAN. Is that demonstratable across the country?

Ms. EARP. Yes.

Mr. MOLLOHAN. Well, would you give us detail on that please?

Ms. EARP. Sure.

Mr. MOLLOHAN. I mean right now. Can you do it right now? Talk to us about how the workload has gone down.

Ms. EARP. Well, the state and local agencies around the country are somewhat uneven. They have different responsibilities. Some of them can take a charge all the way to an administrative decision. Others merely complete an investigation. But over the last several years, the charge receipts from state and local agencies have trended downward.

Mr. MOLLOHAN. And this reduction will not result in an increase of charges being carried forward, or create a backlog at the state and local level?

Ms. EARP. We do not think so because the charges are considered dual filed. When they are filed with the state or local agency, or whether they are filed with us, ultimately they are considered filed with EEOC.

Mr. MOLLOHAN. Well if that is true I would think almost by definition they would be carrying increased backlogs. Because you are, and if they are dual filed and you are not disposing of them, then why are they not increasing at the state level?

Ms. EARP. Well we think that is why our receipts are going up, because they are decreasing at the state and local level.

Mr. MOLLOHAN. Well, would it not be to your advantage then to promote the states taking up and disposing of these cases at the state level? And are you doing that?

Ms. EARP. We work very, very closely with the FEPAs. We use some of them not just for processing charges but conducting investigations, mediations——

Mr. MOLLOHAN. But are you promoting their taking cases? I guess that is an outreach and education effort and I know that your outreach and education budget is going down.

Ms. EARP. Because the front line activities, our priorities are investigations and legal to put——

Mr. MOLLOHAN. Do you think the states are not taking cases, or are assuming a declining responsibility in this area in part because they are not being encouraged or educated or outreached by the national EEOC?

Ms. EARP. No, I do not think that.

Mr. MOLLOHAN. Really?

Ms. EARP. I think that across the country there are complex reasons why some state and local agencies do very well and some do not. On average, their receipts have been trending downward.

Mr. MOLLOHAN. No, I know that and that is why we are asking these questions. I am sure it is an uneven experience across the United States. Some states are leaning forward in this area and some states not. But that was not my question. My question was, do you think you could reverse what is an unfortunate trend line? With backlogs going up nationally there is obviously a need out there. So it is unfortunate that the states are not taking it up. But is that possibly in part because the federal government is not being aggressive enough in outreaching and encouraging the states to take on this responsibility? Which if they were to do it would arguably lighten your load.

Ms. EARP. I think that we could always improve our support of the FEPAs by advancing them more.

Mr. MOLLOHAN. Well, you have a variety of outreach and education programs. I really would like to know an answer to this. You are requesting less and less money all the time for education and outreach. That is going down. I know the focus of your outreach and education is to the companies, it is to the communities, it is telling people what their rights are. But is part of your education and outreach program to the states also? Or not?

Ms. EARP. It could be. Typically they are our partners in the various outreach activities.

Mr. MOLLOHAN. Okay. Well these three sources are on the decline and your justification states that, “We plan to reduce the resources committed to this activity,” outreach, “to support our administrative enforcement inventory reduction.” Well, we are extremely supportive of backlog reduction. But I am not sure I see why that would come at the expense of outreach and education. Why should we treat these two activities as though they were a zero sum game?

Ms. EARP. Basically, because everything cannot be a number one priority.

Mr. MOLLOHAN. Basically because you have not been given enough money. You would like to have more money in education and outreach? Is that correct? You would like to have more. I am not asking you to disown OMB as much as you would like to. Well, that was presumptuous. I take that back. Don’t tell them I said that, will you please, Mr. Frelinghuysen?

HEADQUARTERS RESTRUCTURING

What is the status of your headquarters restructuring effort?

Ms. EARP. It is on hold. We are a commission and we have not been able to reach a consensus, majority point of view, to reorganize headquarters.

Mr. MOLLOHAN. What options are being considered by the work group, or by the group of folks that are considering this question?

Ms. EARP. Basically, the work group is looking at ways to be more efficient in the service to the field, to eliminate redundancies in headquarters, and there are a few. But at this point we do not see any consensus for moving forward.

Mr. MOLLOHAN. Does your budget request take into consideration a headquarter restructuring?

Ms. EARP. No, but it does take into consideration about a 20 percent attrition rate of headquarters staff.

Mr. MOLLOHAN. Do you think that is realistic?

Ms. EARP. It has been borne out more or less, senior people retiring in Washington.

Mr. MOLLOHAN. Well, are they not going to be replaced?

Ms. EARP. Where we have the opportunity to replace for the most part we are not doing it at headquarters. We are replacing in the field.

Mr. MOLLOHAN. How many people do you have working in headquarters?

Ms. EARP. 450.

Mr. MOLLOHAN. And as they retire? What explains the attrition?

Ms. EARP. Mostly retirements, but also promotions and just other opportunities.

Mr. MOLLOHAN. Okay. And you are not replacing these people?

Ms. EARP. For the most part, no.

Mr. MOLLOHAN. Does the fact that you are not replacing them partly explain your growing backlogs?

Ms. EARP. No. Washington has less effect on helping to process the inventory than the field does.

Mr. MOLLOHAN. Have you done an assessment of what is needed in headquarters in terms of employment recently? Because it sounds like you do not need this number of people, if you are not replacing them when they leave.

Ms. EARP. We hoped to accomplish just that with the headquarters working group but, again, we were not able to reach consensus so we have not had an opportunity to fully review where efficiencies could be gained in headquarters.

Mr. MOLLOHAN. Well, we need a little more information on this. I mean, most agencies can tell you how many people they need operating in the various offices that are under their jurisdiction. So I guess the question is, how many people do you need working at headquarters? Can you tell us that?

Ms. EARP. That is a question that I had hoped the working group would answer.

Mr. MOLLOHAN. Well of course you are answering it as a matter of practice every day when you are not replacing people who are leaving. You are saying, “Well, we do not need that person.”

Ms. EARP. Well, what I am doing is robbing Peter to pay Paul. Essentially, if I have a GS–14 who retires in Washington, D.C. but I need an investigator in Tupelo, Mississippi I am going to try to make sure I put that investigator close to the field, to where that person is needed in the field. It is prioritizing.

Mr. MOLLOHAN. Have you had an outside entity, GAO or the IG, look at your staffing needs from headquarters down to the field offices recently?

Ms. EARP. The working group that looked at headquarters repositioning essentially recommended that we have an outside firm with organizational development expertise look at headquarters.

Mr. MOLLOHAN. When was that recommendation made?

Ms. EARP. Last fall.

Mr. MOLLOHAN. And what has happened to that recommendation?

Ms. EARP. We have not acted on it because to spend the money we need a consensus from our commissioners to do it. And there is no consensus.

Mr. MOLLOHAN. How much money would be involved? Do you have an estimate?

Ms. EARP. Quarter of a million dollars.

Mr. MOLLOHAN. In other words, some of the commissioners want to have the study and some commissioners do not?

Ms. EARP. Yes. And for some of the commissioners timing is important.

HEADQUARTERS RELOCATION

Mr. MOLLOHAN. Okay, I feel like we just got into a political quagmire here and I do not know where to go exactly with this so we will follow up in different ways. You are planning on relocating your headquarters from L Street to M Street. Where are you on L Street?

Ms. EARP. Right now we are at 1801 L, Northwest.

Mr. MOLLOHAN. 1801 L Street, just off Connecticut Avenue?

Ms. EARP. Yes, a block up.

Mr. MOLLOHAN. How long have you been there?

Ms. EARP. Almost twenty years.

Mr. MOLLOHAN. So you are one block north? M? H, I, J, K, L, M?

Ms. EARP. We are moving to NOMA in Northeast.

Mr. MOLLOHAN. Well, everybody wants to get in on this. Are we excited about this move? So southeast?

Ms. EARP. Northeast.

Mr. MOLLOHAN. Oh, northeast. Northeast, okay. Well, your security costs are supposed to go up by $1 million? Somebody has done a study here and came up with that estimate, is that correct?

Ms. EARP. Well, basically the Department of Homeland Security tells us what our security costs will be.

Mr. MOLLOHAN. Oh, really. It is in their building or something?

Ms. EARP. Well, they control how many cameras——

Mr. MOLLOHAN. Okay.

Ms. EARP [continuing]. How many guards we have to have.

Mr. MOLLOHAN. Okay, how are you going to pay for that?

Ms. EARP. Some of it is absorbed in the cost of the move because we have been planning for the move for a number or years, and GSA has built it into this total move package.

Mr. MOLLOHAN. Because you have not requested anything for the extra security.

Ms. EARP. No.

Mr. MOLLOHAN. Well, that is an annualized item, is it not?

Ms. EARP. Yes.

ENGLISH ONLY IN THE WORK PLACE

Mr. MOLLOHAN. Okay. I have to ask a question about English-only workplace rules. As you are certainly aware, there has been considerable congressional interest in the EEOC's pursuit of discrimination charges relating to English-only workplace rules. I would like to give you an opportunity to explain EEOC's legal reasoning on these cases and to put them into perspective compared to EEOC's overall employment discrimination workload. It is my understanding that the EEOC supports an employer's right to promulgate an English-only rule, but only in certain circumstances. So can you explain to us those circumstances where English-only rules are necessary and those where they are discriminatory?

Ms. EARP. Very briefly, the Equal Employment Opportunity Commission does not believe that employers should have proxies for race or national origin, or any other unlawful basis. And sometimes requiring English can be a proxy for discrimination based on national origin. If the job involves health, safety, those kind of things, we believe that an employer should be able to make a rational justification to require English within the context of the job. Not, however, when a person is on a lunch break or a bathroom break, or coming or going to work. It is a thirty-year policy of EEOC.

Mr. MOLLOHAN. You sounded like you really got into your——

Ms. EARP. That is my comfort zone.

Mr. MOLLOHAN [continuing]. Into your comfort zone right there. Good for you. What portion of your charge receipts allege discrimination based on English-only policies?

Ms. EARP. Very, very, very small.

Mr. MOLLOHAN. Very few?

Ms. EARP. Very few.

Mr. MOLLOHAN. Are you familiar with the provision that the Senate tried to put into our bill last year regarding this matter?

Ms. EARP. Yes.

Mr. MOLLOHAN. Without getting into it, did you oppose or support that initiative?

Ms. EARP. I support my agency's thirty-year policy. I believe it is.

Mr. MOLLOHAN. Which that would have contradicted. That provision would have contradicted it. It would not have been consistent with the standard you just testified to, am I correct?

Ms. EARP. Employers can require that English be spoken when there is a rational, business reason to do that.

Mr. MOLLOHAN. Okay. All right. Mr. Frelinghuysen? Okay. We will have some questions for the record. We very much appreciate your testimony here today. We appreciate your good work trying to work with declining scarce resources each and every year during the last eight or so years. We appreciate the good work of all of your staff, those who are here and those who are out in the field working hard to see that the mission of the EEOC is carried out properly and effectively. So thank you again for your testimony. We look forward to working with you and getting some information from you that you have committed to supplying to us in the next short time frame.

Ms. EARP. Thank you, sir.

Mr. MOLLOHAN. Thank you very much, Ms. Earp. The hearing is adjourned.

[Questions and answers submitted for the record follow:]

CHAIRMAN MOLLOHAN
QUESTIONS FOR THE RECORD
U.S. EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

Reducing the Charge Backlog

1. **Please provide an electronic copy (Excel spreadsheet) of the Inventory and Resolutions Workload Table from pages 57 and 58 of the EEOC FY 2009 budget request.**

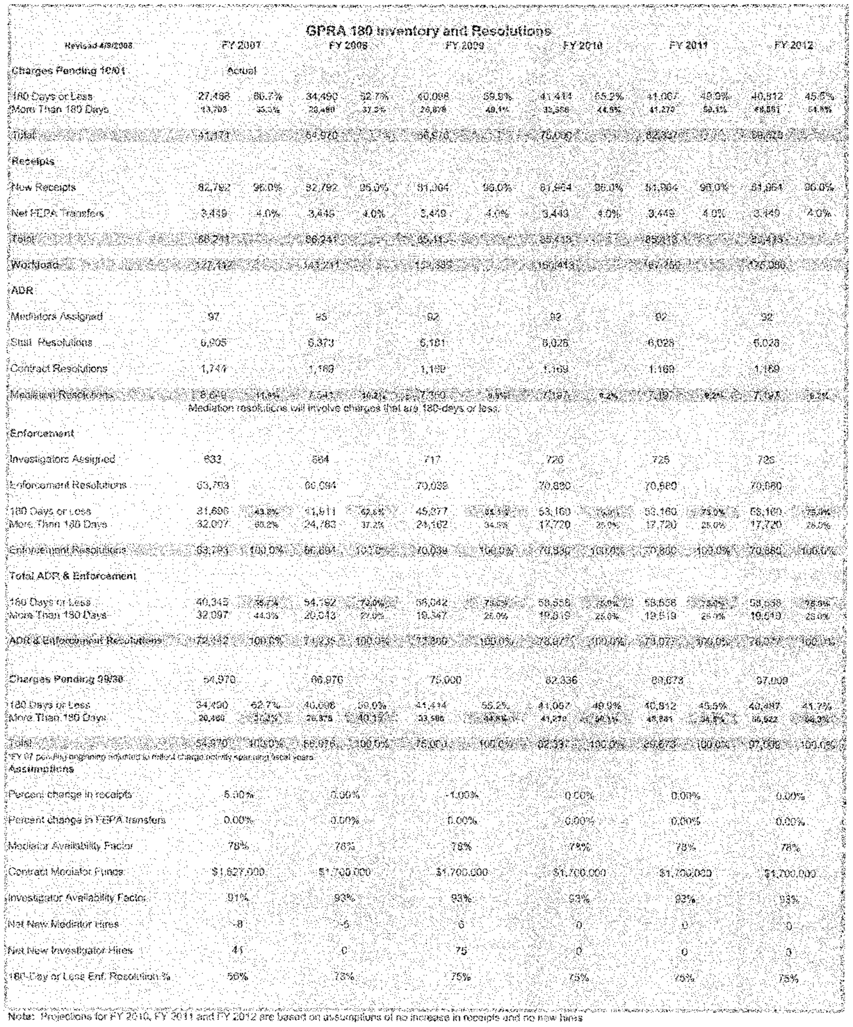
We have provided as **Attachment I** an electronic copy (Excel spreadsheet) of the Inventory and Resolutions Workload Table from pages 57 and 58 of the EEOC FY 2009 budget request.

In order to cut the charge backlog in half by 2012, how many personnel would be required? Assume that hiring is spread evenly over this period of time and receipts are consistent with the 10 year average.

The 2009 President's Budget provides resources for 2,556 full-time equivalent employees – 175 more FTE than the Commission will have in 2008. Of these additional staff, 109 are personnel to address the Commission's private-sector charge workload. We believe the 2009 Budget provides sufficient support for our effort to reduce the inventory and our average charge processing time, while balancing many other competing priorities Government-wide and reflecting the President's commitment to eliminating the budget deficit by 2012.

We have provided as **Attachment II** a workload chart that reflects the assumptions of a fixed receipt rate based on the last 10 years (FY 98-FY 07) which computes as 79,693; that hiring is evenly spread throughout each fiscal year; and that there would be 100% backfill of all attrited positions. EEOC originally projected inventory at the end of FY 09 would be 75,000; half would be 37,500. With the hiring of 93 new investigators and 6 new mediators in each fiscal year between 2009 and 2012 (spread evenly throughout each fiscal year), the agency would achieve a pending inventory at the end of FY 12 of 37,392. Please note that once the inventory reaches this point, the number of investigators and mediators needed to keep the inventory at that level will decrease, unless incoming receipts rise to about 100,000 per year.

ATTACHMENT I



GPRA 180 Inventory and Resolutions

Revised 4/9/2008

	FY 2007		FY 2008		FY 2009		FY 2010		FY 2011		FY 2012	
Charges Pending 10/01	Actual											
180 Days or Less	27,468	66.7%	34,490	62.7%	40,098	59.9%	41,414	55.2%	41,067	49.9%	40,812	45.5%
More Than 180 Days	13,703	33.3%	20,480	37.3%	26,878	40.1%	33,586	44.8%	41,270	50.1%	48,861	54.5%
Total	41,171		54,970		66,976		75,000		82,337		89,673	
Receipts												
New Receipts	82,792	96.0%	82,792	96.0%	81,964	96.0%	81,964	96.0%	81,964	96.0%	81,964	96.0%
Net FEPA Transfers	3,449	4.0%	3,449	4.0%	3,449	4.0%	3,449	4.0%	3,449	4.0%	3,449	4.0%
Total	86,241		86,241		85,413		85,413		85,413		85,413	
Workload	127,412		141,211		152,389		160,413		167,750		175,086	
ADR												
Mediators Assigned	97		85		92		92		92		92	
Staff Resolutions	6,905		6,373		6,181		6,028		6,028		6,028	
Contract Resolutions	1,744		1,169		1,169		1,169		1,169		1,169	
Mediation Resolutions	8,649	11.9%	7,542	10.2%	7,350	9.5%	7,197	9.2%	7,197	9.2%	7,197	9.2%
	Mediation resolutions will involve charges that are 180-days or less.											
Enforcement												
Investigators Assigned	633		684		717		726		726		726	
Enforcement Resolutions	63,793		66,694		70,039		70,880		70,880		70,880	
180 Days or Less	31,696	49.8%	41,911	62.8%	45,877	65.5%	53,160	75.0%	53,160	75.0%	53,160	75.0%
More Than 180 Days	32,097	50.2%	24,783	37.2%	24,162	34.5%	17,720	25.0%	17,720	25.0%	17,720	25.0%
Enforcement Resolutions	63,793	100.0%	66,694	100.0%	70,039	100.0%	70,880	100.0%	70,880	100.0%	70,880	100.0%
Total ADR & Enforcement												
180 Days or Less	40,345	55.7%	54,192	73.0%	56,042	74.3%	58,558	75.0%	58,558	75.0%	58,558	75.0%
More Than 180 Days	32,097	44.3%	20,043	27.0%	19,347	25.7%	19,519	25.0%	19,519	25.0%	19,519	25.0%
ADR & Enforcement Resolutions	72,442	100.0%	74,235	100.0%	75,389	100.0%	78,077	100.0%	78,077	100.0%	78,077	100.0%
Charges Pending 09/30	54,970		66,976		75,000		82,336		89,673		97,009	
180 Days or Less	34,490	62.7%	40,098	59.9%	41,414	55.2%	41,067	49.9%	40,812	45.5%	40,487	41.7%
More Than 180 Days	20,480	37.3%	26,878	40.1%	33,586	44.8%	41,270	50.1%	48,861	54.5%	56,522	58.3%
Total	54,970	100.0%	66,976	100.0%	75,000	100.0%	82,337	100.0%	89,673	100.0%	97,009	100.0%

*FY 07 pending beginning adjusted to reflect charge activity spanning fiscal years

Assumptions	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Percent change in receipts	5.00%	0.00%	-1.00%	0.00%	0.00%	0.00%
Percent change in FEPA transfers	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Mediator Availability Factor	78%	78%	78%	78%	78%	78%
Contract Mediator Funds	$1,627,000	$1,700,000	$1,700,000	$1,700,000	$1,700,000	$1,700,000
Investigator Availability Factor	91%	93%	93%	93%	93%	93%
Net New Mediator Hires	-8	-6	6	0	0	0
Net New Investigator Hires	41	0	75	0	0	0
180-Day or Less Enf. Resolution %	50%	73%	75%	75%	75%	75%

Note: Projections for FY 2010, FY 2011 and FY 2012 are based on assumptions of no increase in receipts and no new hires

ATTACHMENT II

GPRA 180 Inventory and Resolutions

Revised 4/24/2008	FY 2007		FY 2008		FY 2009		FY 2010		FY 2011		FY 2012	
Charges Pending 10/01	Actual											
180 Days or Less	27,468	66.7%	34,490	62.7%	40,098	59.9%	40,188	54.1%	35,580	50.0%	30,863	52.3%
More Than 180 Days	13,703	33.3%	20,480	37.3%	26,878	40.1%	33,586	45.9%	35,531	50.0%	28,130	47.7%
Total	41,171		54,970		66,976		73,772		71,120		58,993	
Receipts												
New Receipts	82,792	96.0%	82,792	96.0%	79,693	95.9%	79,693	95.9%	79,693	95.9%	79,693	95.9%
Net FEPA Transfers	3,449	4.0%	3,449	4.0%	3,449	4.1%	3,449	4.1%	3,449	4.1%	3,449	4.1%
Total	86,241		86,241		83,142		83,142		83,142		83,142	
Workload	127,412		141,211		150,118		156,914		154,262		142,135	
ADR												
Mediators Assigned	97		95		92		98		104		110	
Staff Resolutions	6,905		6,373		6,181		6,421		6,814		7,207	
Contract Resolutions	1,744		1,169		1,169		1,169		1,169		1,169	
Mediation Resolutions	8,649	11.9%	7,542	10.2%	7,350	9.7%	7,590	8.8%	7,983	8.4%	8,376	8.0%
	Mediation resolutions will involve charges that are 180-days or less.											
Enforcement												
Investigators Assigned	633		684		702		801		894		987	
Enforcement Resolutions	63,793		66,694		68,537		78,204		87,286		96,367	
180 Days or Less	31,696	49.8%	41,911	62.8%	44,764	65.3%	58,653	75.0%	65,464	75.0%	72,275	75.0%
More Than 180 Days	32,097	50.2%	24,783	37.2%	23,773	34.7%	19,551	25.0%	21,822	25.0%	24,092	25.0%
Enforcement Resolutions	63,793	100.0%	66,694	100.0%	68,537	100.0%	78,204	100.0%	87,286	100.0%	96,367	100.0%
Total ADR & Enforcement												
180 Days or Less	40,345	55.7%	54,192	73.0%	59,915	79.0%	64,345	75.0%	71,451	75.0%	78,557	75.0%
More Than 180 Days	32,097	44.3%	20,043	27.0%	15,972	21.0%	21,449	25.0%	23,817	25.0%	26,186	25.0%
ADR & Enforcement Resolutions	72,442	100.0%	74,235	100.0%	75,887	100.0%	85,794	100.0%	95,268	100.0%	104,743	100.0%
Charges Pending 09/30	54,970		66,976		74,231		71,120		58,994		37,392	
180 Days or Less	34,490	62.7%	40,098	59.9%	40,186	54.1%	35,589	50.0%	30,863	52.3%	26,345	70.5%
More Than 180 Days	20,480	37.3%	26,878	40.1%	33,586	45.9%	35,531	50.0%	28,130	47.7%	11,047	29.5%
Total	54,970	100.0%	66,976	100.0%	73,772	100.0%	71,120	100.0%	58,993	100.0%	37,392	100.0%
FY 07 pending beginning adjusted to reflect charge activity spanning fiscal years												
Assumptions												
Percent change in receipts	5.00%		0.00%		fixed 10 yr ave		0.00%		0.00%		0.00%	
Percent change in FEPA transfers	0.00%		0.00%		0.00%		0.00%		0.00%		0.00%	
Mediator Availability Factor	78%		78%		78%		78%		78%		78%	
Contract Mediator Funds	$1,627,000		$1,700,000		$1,700,000		$1,700,000		$1,700,000		$1,700,000	
Investigator Availability Factor	91%		93%		93%		93%		93%		93%	
Net New Mediator Hires	-8		-5		8		6		6		6	
Net New Investigator Hires	41		0		100		93		93		93	
180-Day or Less Enf. Resolution %	56%		73%		75%		75%		75%		75%	

2. **Can you attach a rough cost to this personnel estimate? Assume inflation of 3% per year.**

The table below provides EEOC's projected costs, above those contained in our FY 2009 budget proposal, for additional personnel to cut the agency's projected inventory in half by the end of FY 2012.

Fiscal Year	**Budget Requirement**
2010	$5 million
2011	10 million
2012	19 million
Total	$34 million

We projected the yearly costs for hiring 93 GS- 7 investigators and 6 GS-13 mediators (all at step 1) each fiscal year from 2010 – 2012, assuming that the investigators would receive career ladder promotions each fiscal year; 30 support staff hired during FY 2010 only at the GS-9 and GS-5 levels assuming no promotions. The methodology is as follows:

Year	Position	#FTE hired– 1st quarter 75%	#FTE hired– 2nd quarter 50%	#FTE hired- 3rd quarter 20%	#FTE hired - 4th quarter 0%	#FTE on board entire FY
2010	investigators	23 – GS-7	23 – GS-7	24 – GS-7	23 -GS-7	
2010	mediators	1 – GS-13	2 – GS-13	2 – GS-13	1-GS-13	
2010	support staff					19- GS-9 11- GS-5
2011	investigators	23 - GS-7	23- GS-7	24-GS-7	23-GS-7	93- GS-9
2011	mediators	1- GS-13	2- GS-13	2-GS-13	1-GS-13	6- GS-13
2012	investigators	23 – GS-7	23 – GS-7	24- GS-7	23-GS-7	93- GS-9 93- GS-11
2012	mediators	1 - GS-13	2 – GS-13	2-GS-13	1-GS-13	12-GS-13

3. **The Inventory and Resolutions Workload Table in the budget request assumes a decrease in receipts and an increase in resolutions compared to FY 2007. How do you justify these assumptions, and do you have data to support them?**

The increase of 1,793 resolutions in FY 2008 (total projected 74,235) over the 72,442 in FY 2007 is based on the hiring of additional investigators in FY 2007. These investigators then become fully productive during FY 2008. Similarly, while there is a "no new hiring" assumption in FY 2008, we project that with the hiring of 75 additional investigators and 6 additional mediators in FY 2009, the number of resolutions in FY 2009 will be 77,389, which is 3,154 resolutions higher than the projection for FY 2008.

Projecting agency receipts from year-to-year is a difficult task, given the many external variables that can influence our annual receipt rates. Fluctuations in the economy, visibility in the press given to key workplace issues, Supreme Court decisions, legislative developments, and various outreach programs launched by EEOC are just some examples of the influences on our receipt rate. Indicative of this is the Genetic Information Nondiscrimination Act which was recently passed by Congress, and which, if signed by the President, we estimate will add 1,000 new charges per year to EEOC's workload.
Additionally, charting out receipt rates far into the future is more difficult given the unknown factors that may affect receipts in the future.

Receipts for FY 2008 were projected using linear trend analysis and judgment. The data were analyzed using the linear, polynomial, and moving average trend analysis, and all produced a projected level within a range of about 1,500, and all showed a slight reduction in receipts for 2008. We projected no change for 2008 because early data for 2007 indicated an increase higher than expected and we modified our projection to reflect that information.

Staffing

1. **Please explain how EEOC translates a need for additional personnel into a dollar amount requested.**

EEOC translates a need for additional personnel by costing for new hires at the GS grade level, step one x 1.28 = (salary + benefits) x pay adjustment + one-time start up costs (year 1) + recurring costs (year 1+) = funding requirement.

The start-up costs are as follows:

Type of costs	**Amount**
One time recruiting & hiring per employee	$1,300
Background investigations per employee	$ 600
Orientation/training per employee	$2,500
Total	$4,400

The recurring costs are as follows:

Type of Cost	**Amount**
Rent and square feet build-out per employee	$ 7,500
Computer, phone, tech support per employee	$ 3,400
Total	$10,900

2. **Assuming the EEOC budget request is enacted without change, how many "unfunded FTE" (i.e., FTE below the ceiling) would EEOC have in FY 2009? Is this an increase or a decrease from the number of unfunded FTE in FY 2008, and what is the cause of this increase or decrease?**

Assuming the pay raise requested in the President's Budget we expect that we will be able to support the FTE levels shown in the 2009 President's Budget.

3. **How much would it cost to fund those unfunded FTE?**

As per the answer to #2, we expect to be able to fund the FTE published in the President's Budget.

4. **When does the EEOC expect to complete its strategic human capital plan?**

EEOC's Office of Human Resources will submit the proposed human capital plan to the EEOC Chair on or before September 30, 2008.

Call Center Migration

1. **When does EEOC expect to have data on the level of customer satisfaction with the new in-house call intake process?**

The EEOC has worked with the U.S. Department of Treasury, who contracts with an outside firm, the Claes Fornell International Group, to conduct a customer satisfaction survey utilizing the American Customer Satisfaction Index (ACSI). We expect to have full results by the end of October 2008.

2. **Do you have comparable customer satisfaction data from the National Contact Center so that we can draw meaningful distinctions between the two?**

For the past two years, the EEOC has worked with Treasury and they have used their contract with the Claes Fornell International (CFI) Group to conduct a customer satisfaction survey utilizing the American Customer Satisfaction Index (ACSI). In 2006, the first year of the survey, it focused on the contracted-out National Contact Center – with the center receiving a score of 77, well above the federal average of 71. In 2007, the survey was expanded to include EEOC field offices as well as the NCC. The field offices and the NCC scored above the federal average, with the overall EEOC ACSI score of 72 for phone and email. Both the NCC and field offices scored 73 on their phone models; however, the email model of the NCC scored only 56. Field offices did not handle public emails at that time.

3. **Has EEOC done a cost-benefit analysis on the idea of hiring higher graded employees to handle call intake responsibilities? If yes, what were the results? If not, would you consider doing so?**

EEOC has not conducted a cost-benefit analysis. As with most executive agencies, the only consideration allowed in determining series, title, and grade level of General Schedule positions is a comparison of assigned duties and responsibilities with published Office of Personnel Management (OPM) classification and qualification standards.

An evaluation of the Call Center migration positions was conducted in July and August 2007 by the EEOC Office of Human Resources (OHR). OHR reviewed proposed duties and responsibilities, and compared them with published classification standards. As a result, two new EEOC positions were established and documented in position descriptions of record: a GS-1802-05 Investigative Support Assistant (Information Intake Representative) position and a GS-1802-06 Lead Investigative Support Assistant (Lead Information Intake Representative).

The GS-1802 occupational series was determined to be most appropriate, inasmuch as the series reflects the investigative context of the positions and also may provide future opportunities for incumbents to move into other positions in Agency field offices, including higher graded GS-

1802 or similar positions. The GS-05 and GS-06 grade levels were determined based upon the assigned work.

Any future assessment of these positions would require the same approach; that is, a comparison of assigned work with established OPM standards.

State and Local Assistance

1. **Have you alerted the FEPAs and TEROs to your proposal to reduce state and local assistance funding in FY 2009? Were they given any role in developing this proposal, and do they support it?**

This year, during EEOC's annual planning conference with our FEPA counterparts, EEOC's Chief Operating Officer presented information to the group regarding the FY 2009 President's Budget and explained the need to impose reduced funding for State and Local activities in response to the FEPAs' actual production, which has amounted to fewer charges than originally projected in the past few years. Development of EEOC's FEPA budget was part of the internal Executive Branch deliberative process, and so was not shared with the FEPAs or any other outside parties. While the FEPAs understood how and why the decision was made, they expressed their displeasure with this action, especially in view of the impact that local budget reductions are having on their operations.

2. **If increasing the amount available for reimbursement to FEPAs and TEROs can't help them to process and resolve more charges in a year, what could be done to help them increase their resolutions?**

An issue which is negatively impacting the FEPA charge resolution rate is the decline in the number of charge filings that the FEPAs are currently experiencing. This decline in charge filings shrinks the pool from which the FEPA's charge resolutions are derived. Since the FEPA's payment from EEOC is based on charge resolutions submitted under contract, as the number of charges coming in the door decreases, so too does the number of charge resolutions they are able to submit for payment. An internal workgroup tasked with examining changes to the agency processes and improvements has begun to consider whether transferring charges filed with the Commission to the FEPAs will help alleviate the issue of declining FEPA receipts. This workgroup will be making recommendations to the Chair for her consideration within the next 60 days.

3. **How much is the current per charge reimbursement for FEPAs and TEROs, and when was the last time that per charge reimbursement was adjusted? How does the reimbursement compare to the FEPAs' actual per charge costs?**

TEROs are not paid on a per charge basis. They are provided a flat rate of $26,000 per TERO to support their efforts in identifying, eliminating and remedying illegal employment discrimination and to promote and protect the employment rights of Indians working for private employers on or around their reservations.

In FY 1993, the FEPAs per-charge rate was $450 and the TEROs received $22,500 each. The FEPA per charge and per TERO rates increased in 1994 to $500 and $25,000, respectively. These rates were increased in FY 2006, when the FEPA per charge rate increased to $540 per charge and the TERO rate increased to $26,000 for each TERO. In FY 2007, the FEPA per charge rate was increased from $540 to the current rate of $550 per charge. The FEPAs argue that the current per charge rate is significantly below what it cost the FEPAs to process a charge. We are currently working on a project, that will be completed by the end of this fiscal year, to determine what the average cost is for the FEPAs to process a charge.

4. **Would an increase in the per charge reimbursement allow the FEPAs and TEROs to process more charges?**

If, as the FEPAs argue, the $550 per-charge rate that they currently receive is not sufficient to cover the cost of processing a charge, increasing the per-charge reimbursement would serve as an augmentation of the individual FEPA budgets. The additional funding would provide some relief, enabling them to maintain adequate staffing levels and cover other costs associated with charge processing. These are costs that the FEPAs must absorb within their base, often leading to reductions in staff and decreased levels of production. However, such an increase does not remedy the more immediate issue of declining receipts, which as discussed earlier, has an impact on the number of charges available to the FEPA for processing and submitting for payment under contract with EEOC.

Outreach and Education

1. **Can you specify which outreach and education activities will be cut with the $1.5 million reduction in your FY 2009 budget?**

The reduction, which was applied in order to allow us to direct additional resources to our private-sector charge backlog and the new in-house call center, is being applied to staff time on outreach, travel, and printed publications and other informational materials. We believe that our well-established partnerships with Fair Employment Practices agencies and stakeholder organizations will enable us to continue to reach under served communities. In addition, we will continue to make publications available on the Internet and explore other more cost effective ways to provide the public with information about their rights and responsibilities in the workplace.

Headquarters Restructuring

1. **How is EEOC incorporating lessons learned from the field office restructuring experience in your headquarters restructuring plan?**

We sought input from both headquarters and the field on our headquarters restructuring plan, since a principal purpose of reorganizing headquarters was to see if there are ways we can better support our field operations. To that end, a Workgroup consisting of both headquarters and field staff was assembled in spring 2007 to consider headquarters restructuring. That group met several times throughout the year and issued a report to the Chair in December 2007. The Workgroup made several recommendations. In addition, the Chair has shared the report with the other Commissioners and with all of EEOC's senior executives.

At the time of our field repositioning in 2006, it was thought that we might be able to shift resources to the field from headquarters. However, since that time there has been additional attrition in headquarters which renders the likelihood of shifting resources to the field less realistic. Therefore, the Workgroup looked at changes that would make our headquarters operations more efficient, eliminate redundancies, and provide the best program support to our field offices.

There are several considerations that will determine how this project proceeds. The majority of the Workgroup's recommendations did not reflect a substantial consensus on the Workgroup. The issue of whether the Workgroup would benefit from the assistance of an outside expert, and the resultant expenditure of funds, was not resolved by the Commission during the Workgroup's tenure. Lastly, any significant reorganization proposal will require approval, by vote, of the Commission. While some aspects of the Workgroup's recommendations may be proposed for action in the coming months, these factors make it unlikely that any major reorganization of EEOC's headquarters will occur during the balance of 2008.

2. **Please provide a break-out of your onboard headquarters staff, by position, for each of the last 5 fiscal years.**

We have provided as **Attachment III** a break-out of EEOC onboard headquarters staff for the last five fiscal years.

ATTACHMENT III

5/16/2008

FY	Position Title	Total
FY 2003	ACCOUNTANT	3
FY 2003	ACCOUNTING OFFICER	1
FY 2003	ACCOUNTING TECH (DATA TRANS)	6
FY 2003	ADMINISTRATIVE ASSISTANT	1
FY 2003	ADMINISTRATIVE OFFICER	7
FY 2003	ADMINISTRATIVE SPECIALIST	2
FY 2003	ADMINISTRATIVE STAFF ASSISTANT	1
FY 2003	ADMINISTRATIVE SUPPORT ASST	2
FY 2003	ADR PROGRAM ASSISTANT	1
FY 2003	ASSISTANT GENERAL COUNSEL (CR)	2
FY 2003	ASSISTANT LEGAL COUNSEL	1
FY 2003	ASSOCIATE GENERAL COUNSEL FOR APP	1
FY 2003	ASSOCIATE GENERAL COUNSEL FOR SLS	1
FY 2003	ASSOCIATE LEGAL COUNSEL	1
FY 2003	ATTORNEY-ADVISER (LABOR)	1
FY 2003	ATTORNEY-ADVISER (TRNG COORD)	1
FY 2003	ATTORNEY-ADVISOR (CR)	39
FY 2003	ATTORNEY-EXAMINER (CR)	2
FY 2003	AUDIO VISUAL PROD SPEC	1
FY 2003	AUDITOR	2
FY 2003	BUDGET ANALYST	7
FY 2003	BUDGET ASSISTANT (OA)	1
FY 2003	BUDGET OFFICER	1
FY 2003	BUILDING MANAGEMENT SPECIALIST	2
FY 2003	CHAIR, EQUAL EMPLOY OPPTY COMM	1
FY 2003	CHIEF FINANCIAL OFFICER & DIRECTOR OF	1
FY 2003	CHIEF INFORMATION OFFICER	1
FY 2003	CHIEF OPERATING OFFICER	1
FY 2003	CLAIMS OFFICER	1
FY 2003	CLAIMS OFFICER (DEBT COLLECTION)	1
FY 2003	CLERK	1
FY 2003	COMMUNICATIONS & AUDIOVISUAL SPEC	1
FY 2003	COMPUTER ASSISTANT	2
FY 2003	CONFIDENTIAL ASSISTANT	2
FY 2003	CONFIDENTIAL SUPPORT ASSISTANT	1
FY 2003	CONGRESSIONAL LIAISON SPECIALIST	4
FY 2003	CONTRACT SPECIALIST	4
FY 2003	CRIMINAL INVESTIGATOR	2
FY 2003	DEPUTY GENERAL COUNSEL	1
FY 2003	DEPUTY INSPECTOR GENERAL	1
FY 2003	DIR,OFF OF FEDERAL OPERATIONS	1
FY 2003	DIRECTOR OF HUMAN RESOURCES	1
FY 2003	DIRECTOR, LEGISLATIVE AFFAIRS STAFF	1
FY 2003	DIRECTOR, OFFICE OF FIELD PROGRAMS	1
FY 2003	DIRECTOR,FEDERAL SECTOR PROGRAMS	1
FY 2003	ECONOMIST	1
FY 2003	EMPLOYMENT SURVEY PROGRAM SPECIALIST	2
FY 2003	EQUAL EMPLOYMENT ASSISTANT (OA)	1
FY 2003	EQUAL EMPLOYMENT MANAGER	1
FY 2003	EQUAL EMPLOYMENT SPECIALIST	20
FY 2003	EQUAL OPPORTUNITY ASSISTANT (OA)	11
FY 2003	EQUAL OPPORTUNITY EVALUATOR	1
FY 2003	EVALUATOR	1
FY 2003	EXECUTIVE OFFICER	1
FY 2003	FINANCIAL MANAGER	1
FY 2003	FINANCIAL TECHNICIAN (OA)	2
FY 2003	GENERAL ATTORNEY (CR)	100
FY 2003	GENERAL COUNSEL	1
FY 2003	HUMAN RESOURCES ASSISTANT (OA)	1
FY 2003	HUMAN RESOURCES ASST (EMP BENEFITS)	1
FY 2003	HUMAN RESOURCES PAYROLL SPECIALIST	1

FY 2003	HUMAN RESOURCES SPEC (CLASSIFICATION)	1
FY 2003	HUMAN RESOURCES SPEC (PERF MGMNT)	1
FY 2003	HUMAN RESOURCES SPECIALIST	20
FY 2003	INFORMATION ASSISTANT (OA)	1
FY 2003	INFORMATION LIAISON ASSISTANT	1
FY 2003	INFORMATION SPECIALIST	5
FY 2003	INFORMATION TECHNOLOGY SPECIALIST	43
FY 2003	INSPECTOR GENERAL	1
FY 2003	INTERPRETER	4
FY 2003	INVESTIGATOR	3
FY 2003	IT SPECIALIST (INET)	2
FY 2003	LABOR ECONOMIST	1
FY 2003	LAW CLERK	1
FY 2003	LEAD HUMAN RESOURCES SPEC	1
FY 2003	LEGAL COUNSEL	1
FY 2003	LEGAL TECHNICIAN (OA)	1
FY 2003	LIBRARIAN	1
FY 2003	MANAGEMENT & PROG ANALYST	5
FY 2003	MANAGEMENT & PROGRAM ANALYSIS OFF	1
FY 2003	MANAGEMENT ANALYSIS OFFCR	1
FY 2003	MANAGEMENT ANALYST	7
FY 2003	MANAGEMENT ASSISTANT (OA)	2
FY 2003	MANAGEMENT INFORMATION SPECIALIST	2
FY 2003	MATHEMATICAL STATISTICIAN	1
FY 2003	MEMBER,EQUAL EMPLOY OPPTY COMM	2
FY 2003	OFFICE AUTOMATION ASSISTANT	3
FY 2003	OFFICE AUTOMATION CLERK	1
FY 2003	OPERATING ACCOUNTANT	1
FY 2003	OPERATIONS & POLICY SPECIALIST	2
FY 2003	OPERATIONS RESEARCH ANALYST	1
FY 2003	PARALEGAL SPECIALIST	6
FY 2003	PERSONNEL RESEARCH PSYCHOLOGIST	1
FY 2003	PERSONNEL RESEARCH SPECIALIST	1
FY 2003	POLICY ANALYST	2
FY 2003	PROCUREMENT ANALYST	1
FY 2003	PROGRAM ANALYSIS OFFICER	1
FY 2003	PROGRAM ANALYST	55
FY 2003	PROGRAM ASSISTANT (OA)	10
FY 2003	PROGRAM MANAGER	5
FY 2003	PROGRAM SPECIALIST	3
FY 2003	PUBLIC AFFAIRS SPECIALIST	4
FY 2003	READING ASSISTANT (OA)	2
FY 2003	RESEARCH ANALYST	4
FY 2003	RESEARCH ASSISTANT	1
FY 2003	SECRETARY (OA)	28
FY 2003	SECRETARY (STENOGRAPHY)	1
FY 2003	SECURITY SPECIALIST	2
FY 2003	SENIOR ADVISOR	4
FY 2003	SOC SCIENCE RESEARCH ANALYST	2
FY 2003	SOCIAL SCIENCE ANALYST	1
FY 2003	SOCIAL SCIENCE RESEARCH SPECIALST	2
FY 2003	SPACE MANAGEMENT ANALYST	3
FY 2003	STAFF ASSISTANT	1
FY 2003	STAFF ASSISTANT (OA)	1
FY 2003	STAFF SPECIALIST	5
FY 2003	STATISTICIAN (GENERAL)	1
FY 2003	STRATEGIC POLICY & PLANNING	1
FY 2003	SUPERVISORY ATTORNEY-ADVISOR (CR)	4
FY 2003	SUPERVISORY ATTORNEY-ADVISOR (LABOR)	1
FY 2003	SUPERVISORY EQUAL EMPLOYMENT SPEC	3
FY 2003	SUPERVISORY GENERAL ATTORNEY (CR)	16
FY 2003	SUPERVISORY INFORMATION TECHNOLOGY	9
FY 2003	SUPERVISORY LIBRARIAN	1

FY 2003	SUPERVISORY SURVEY SPECIALIST	1
FY 2003	SUPERVISORY TRIAL ATTORNEY (CR)	5
FY 2003	SUPPORT SERVICES SPECIALIST	1
FY 2003	SUPPORT SERVICES SUPERVISOR	1
FY 2003	SUPVRY SOCIAL SCIENCE RESEARCH SPEC	1
FY 2003	SUPVY HUMAN RESOURCES SPECIALIST	2
FY 2003	SUPVY MANAGEMENT ANALYST	3
FY 2003	SUPVY OPERATING ACCOUNTANT	1
FY 2003	SUPVY PROGRAM ANALYST	3
FY 2003	SYSTEMS ACCOUNTANT	4
FY 2003	TECHNICAL SPECIALIST	1
FY 2003	TELECOMMUNICATIONS OFFICER	1
FY 2003	TELECOMMUNICATIONS SPECIALIST	1
FY 2003	TRAFFIC MANAGEMENT SPECIALIST	1
FY 2003	TRIAL ATTORNEY (CR)	8
FY 2003	VICE CHAIR, EQUAL EMPLOY OPPOR COMM	1
FY 2003	WRITER - EDITOR	1
FY 2003	**Total**	**598**
FY 2004	ACCOUNTANT	4
FY 2004	ACCOUNTING OFFICER	1
FY 2004	ACCOUNTING TECH (DATA TRANS)	1
FY 2004	ACCOUNTING TECHNICIAN-DEBT COLLECTION	1
FY 2004	ADMINISTRATIVE ASSISTANT	1
FY 2004	ADMINISTRATIVE OFFICER	7
FY 2004	ADMINISTRATIVE SPECIALIST	1
FY 2004	ADMINISTRATIVE STAFF ASSISTANT	1
FY 2004	ADMINISTRATIVE SUPPORT ASSISTANT	1
FY 2004	ADR PROGRAM ASSISTANT	1
FY 2004	ASSISTANT GENERAL COUNSEL (CR)	3
FY 2004	ASSOCIATE GENERAL COUNSEL FOR LMS	1
FY 2004	ASSOCIATE GENERAL COUNSEL FOR SLS	1
FY 2004	ASSOCIATE LEGAL COUNSEL	1
FY 2004	ATTORNEY-ADVISOR (CR)	44
FY 2004	ATTORNEY-ADVISOR (LABOR)	1
FY 2004	ATTORNEY-ADVISOR (TRNG COORD)	1
FY 2004	ATTORNEY-EXAMINER (CR)	2
FY 2004	AUDIO VISUAL PROD SPEC	1
FY 2004	AUDITOR	2
FY 2004	BUDGET ANALYST	5
FY 2004	BUDGET ASSISTANT (OA)	2
FY 2004	BUDGET OFFICER	1
FY 2004	BUILDING MANAGEMENT SPECIALIST	1
FY 2004	CHAIR, EQUAL EMPLOY OPPTY COMM	1
FY 2004	CHIEF FINANCIAL OFFICER & DIRECTOR OF	1
FY 2004	CHIEF HUMAN CAPITAL OFFICER	1
FY 2004	CHIEF INFORMATION OFFICER	1
FY 2004	CHIEF OPERATING OFFICER	1
FY 2004	CLAIMS OFFICER	1
FY 2004	COMPUTER ASSISTANT	2
FY 2004	CONFIDENTIAL ASSISTANT	2
FY 2004	CONGRESSIONAL LIAISON SPECIALIST	4
FY 2004	CONSULTANT	1
FY 2004	CONTRACT SPECIALIST	5
FY 2004	CRIMINAL INVESTIGATOR	2
FY 2004	DEPUTY DIRECTOR	1
FY 2004	DEPUTY GENERAL COUNSEL	1
FY 2004	DEPUTY INSPECTOR GENERAL	1
FY 2004	DIR,OFF OF FEDERAL OPERATIONS	1
FY 2004	DIRECTOR, LEGISLATIVE AFFAIRS STAFF	1
FY 2004	DIRECTOR, OFFICE OF FIELD PROGRAMS	1
FY 2004	DIRECTOR,FEDERAL SECTOR PROGRAMS	1
FY 2004	ECONOMIST	1

FY 2004	EMPLOYMENT DATA TECHNICIAN (OA)	3
FY 2004	EMPLOYMENT SURVEY PROGRAM SPECIALIST	2
FY 2004	EQUAL EMPLOYMENT ASSISTANT (OA)	1
FY 2004	EQUAL EMPLOYMENT MANAGER	1
FY 2004	EQUAL EMPLOYMENT SPECIALIST	20
FY 2004	EQUAL OPPORTUNITY ASSISTANT (OA)	9
FY 2004	EQUAL OPPORTUNITY EVALUATOR	1
FY 2004	EVALUATOR	1
FY 2004	FINANCIAL MANAGER	1
FY 2004	FINANCIAL TECHNICIAN (OA)	3
FY 2004	GENERAL ATTORNEY (CR)	95
FY 2004	GENERAL COUNSEL	1
FY 2004	HUMAN RESOURCES ASSISTANT (OA)	1
FY 2004	HUMAN RESOURCES ASST (EMP BENEFITS)	1
FY 2004	HUMAN RESOURCES SPEC (PERF MGMNT)	1
FY 2004	HUMAN RESOURCES SPECIALIST	18
FY 2004	INFORMATION ASSISTANT (OA)	2
FY 2004	INFORMATION LIAISON ASSISTANT	1
FY 2004	INFORMATION SPECIALIST	5
FY 2004	INFORMATION TECHNOLOGY SPECIALIST	38
FY 2004	INSPECTOR GENERAL	1
FY 2004	INTERPRETER	4
FY 2004	INVESTIGATOR	3
FY 2004	IT SPECIALIST (INET)	3
FY 2004	IT SPECIALIST(PROJECT MANAGER)	1
FY 2004	LABOR ECONOMIST	1
FY 2004	LAW CLERK	2
FY 2004	LEAD HUMAN RESOURCES SPEC	1
FY 2004	LEGAL TECHNICIAN (OA)	2
FY 2004	LIBRARIAN	1
FY 2004	MANAGEMENT & PROG ANALYST	4
FY 2004	MANAGEMENT & PROGRAM ANALYSIS OFF	1
FY 2004	MANAGEMENT ANALYSIS OFFCR	1
FY 2004	MANAGEMENT ANALYST	6
FY 2004	MANAGEMENT ASSISTANT (OA)	2
FY 2004	MANAGEMENT INFORMATION SPECIALIST	2
FY 2004	MATHEMATICAL STATISTICIAN	1
FY 2004	MEMBER,EQUAL EMPLOY OPPTY COMM	2
FY 2004	OFFICE AUTOMATION ASSISTANT	3
FY 2004	OFFICE AUTOMATION CLERK	1
FY 2004	OPERATIONS & POLICY SPECIALIST	1
FY 2004	PARALEGAL SPECIALIST	5
FY 2004	PERSONNEL RESEARCH PSYCHOLOGIST	1
FY 2004	PERSONNEL RESEARCH SPECIALIST	1
FY 2004	POLICY ANALYST	1
FY 2004	PROGRAM ANALYSIS OFFICER	1
FY 2004	PROGRAM ANALYST	52
FY 2004	PROGRAM ASSISTANT (OA)	11
FY 2004	PROGRAM MANAGER	4
FY 2004	PROGRAM SPECIALIST	4
FY 2004	PUBLIC AFFAIRS SPECIALIST	5
FY 2004	READING ASSISTANT (OA)	1
FY 2004	RESEARCH ANALYST	4
FY 2004	RESEARCH ASSISTANT	1
FY 2004	SECRETARY (OA)	27
FY 2004	SECRETARY (STENOGRAPHY)	1
FY 2004	SECURITY SPECIALIST	1
FY 2004	SENIOR ADVISOR	2
FY 2004	SENIOR OPERATING ACCOUNTANT	1
FY 2004	SOC SCIENCE RESEARCH ANALYST	1
FY 2004	SOCIAL SCIENCE ANALYST	1
FY 2004	SOCIAL SCIENCE RESEARCH SPECIALST	1
FY 2004	SPACE MANAGEMENT ANALYST	3

FY 2004	STAFF ASSISTANT	1
FY 2004	STAFF SPECIALIST	4
FY 2004	STATISTICIAN (GENERAL)	1
FY 2004	STRATEGIC POLICY & PLANNING	1
FY 2004	SUPERVISORY ATTORNEY-ADVISOR (CR)	4
FY 2004	SUPERVISORY ATTORNEY-ADVISOR (LABOR)	1
FY 2004	SUPERVISORY EQUAL EMPLOYMENT SPEC	3
FY 2004	SUPERVISORY GENERAL ATTORNEY (CR)	16
FY 2004	SUPERVISORY INFORMATION TECHNOLOGY	8
FY 2004	SUPERVISORY LIBRARIAN	1
FY 2004	SUPERVISORY SURVEY SPECIALIST	1
FY 2004	SUPERVISORY TRIAL ATTORNEY (CR)	4
FY 2004	SUPPORT SERVICES SPECIALIST	1
FY 2004	SUPPORT SERVICES SUPERVISOR	1
FY 2004	SUPVRY SOCIAL SCIENCE RESEARCH SPEC	1
FY 2004	SUPVY HUMAN RESOURCES SPECIALIST	2
FY 2004	SUPVY INFORMATION TECHNOLOGY SPEC.	1
FY 2004	SUPVY MANAGEMENT ANALYST	2
FY 2004	SUPVY PROGRAM ANALYST	3
FY 2004	SYSTEMS ACCOUNTANT	4
FY 2004	TECHNICAL SPECIALIST	1
FY 2004	TELECOMMUNICATIONS ASSISTANT	1
FY 2004	TELECOMMUNICATIONS OFFICER	1
FY 2004	TELECOMMUNICATIONS SPECIALIST	1
FY 2004	TRAFFIC MANAGEMENT SPECIALIST	1
FY 2004	TRIAL ATTORNEY (CR)	7
FY 2004	VICE CHAIR, EQUAL EMPLOY OPPOR COMM	1
FY 2004	WRITER - EDITOR	1
FY 2004	**Total**	**566**
FY 2005	ACCOUNTANT	2
FY 2005	ACCOUNTING OFFICER	1
FY 2005	ACCOUNTING TECHNICIAN-DEBT COLLECTION	1
FY 2005	ADMINISTRATIVE OFFICER	6
FY 2005	ADMINISTRATIVE SPECIALIST	2
FY 2005	ADMINISTRATIVE STAFF ASSISTANT	2
FY 2005	ADMINISTRATIVE SUPPORT ASSISTANT	1
FY 2005	ADR PROGRAM ASSISTANT	1
FY 2005	ASSISTANT GENERAL COUNSEL (CR)	3
FY 2005	ASSOCIATE GENERAL COUNSEL FOR LMS	1
FY 2005	ASSOCIATE GENERAL COUNSEL FOR SLS	1
FY 2005	ASSOCIATE LEGAL COUNSEL	1
FY 2005	ATTORNEY-ADVISER	1
FY 2005	ATTORNEY-ADVISOR (CR)	43
FY 2005	ATTORNEY-EXAMINER (CR)	3
FY 2005	AUDITOR	2
FY 2005	BUDGET ANALYST	5
FY 2005	BUDGET ASSISTANT	1
FY 2005	BUDGET ASSISTANT (OA)	1
FY 2005	BUDGET OFFICER	1
FY 2005	CHAIR, EQUAL EMPLOY OPPTY COMM	1
FY 2005	CHIEF FINANCIAL OFFICER & DIRECTOR OF	1
FY 2005	CHIEF HUMAN CAPITAL OFFICER	1
FY 2005	CHIEF INFORMATION OFFICER	1
FY 2005	CHIEF OPERATING OFFICER	1
FY 2005	CLAIMS OFFICER	1
FY 2005	COMPUTER ASSISTANT	1
FY 2005	CONFIDENTIAL ASSISTANT	1
FY 2005	CONGRESSIONAL LIAISON SPECIALIST	4
FY 2005	CONSULTANT	1
FY 2005	CONTRACT SPECIALIST	4
FY 2005	CRIMINAL INVESTIGATOR	2
FY 2005	DEPUTY DIRECTOR	1

FY 2005	DEPUTY GENERAL COUNSEL	1
FY 2005	DEPUTY INSPECTOR GENERAL	1
FY 2005	DIR,OFF OF FEDERAL OPERATIONS	1
FY 2005	DIRECTOR, COMMUNICATIONS STAFF	1
FY 2005	DIRECTOR, LEGISLATIVE AFFAIRS STAFF	1
FY 2005	DIRECTOR, OFFICE OF FIELD PROGRAMS	1
FY 2005	DIRECTOR,FEDERAL SECTOR PROGRAMS	1
FY 2005	ECONOMIST	1
FY 2005	EMPLOYMENT DATA TECHNICIAN (OA)	3
FY 2005	EMPLOYMENT SURVEY PROGRAM SPECIALIST	1
FY 2005	EQUAL EMPLOYMENT ASSISTANT (OA)	1
FY 2005	EQUAL EMPLOYMENT MANAGER	1
FY 2005	EQUAL EMPLOYMENT SPECIALIST	19
FY 2005	EQUAL OPPORTUNITY ASSISTANT (OA)	9
FY 2005	EVALUATOR	1
FY 2005	FINANCIAL MANAGER	1
FY 2005	FINANCIAL TECHNICIAN	1
FY 2005	FINANCIAL TECHNICIAN (OA)	2
FY 2005	GENERAL ATTORNEY (CR)	89
FY 2005	GENERAL COUNSEL	1
FY 2005	HUMAN CAPITAL STRATEGY COORDINATOR	1
FY 2005	HUMAN RESOURCES ASSISTANT (OA)	1
FY 2005	HUMAN RESOURCES ASST (EMP BENEFITS)	1
FY 2005	HUMAN RESOURCES SPEC (CLASSIFICATION)	1
FY 2005	HUMAN RESOURCES SPEC (EMP BENEFITS)	1
FY 2005	HUMAN RESOURCES SPEC (PERF MGMNT)	1
FY 2005	HUMAN RESOURCES SPECIALIST	15
FY 2005	INFORMATION LIAISON ASSISTANT	1
FY 2005	INFORMATION SPECIALIST	5
FY 2005	INFORMATION TECH SPEC (APPSW)	2
FY 2005	INFORMATION TECHNOLOGY SPECIALIST	35
FY 2005	INSPECTOR GENERAL	1
FY 2005	INTERPRETER	3
FY 2005	INVESTIGATOR	3
FY 2005	IT SPECIALIST	1
FY 2005	IT SPECIALIST (CUSTSPT)	1
FY 2005	IT SPECIALIST (INET)	3
FY 2005	IT SPECIALIST(PROJECT MANAGER)	1
FY 2005	LABOR ECONOMIST	1
FY 2005	LAW CLERK	3
FY 2005	LEAD HUMAN RESOURCES SPEC	1
FY 2005	LEGAL TECHNICIAN (OA)	3
FY 2005	LIBRARIAN	1
FY 2005	MANAGEMENT & PROG ANALYST	4
FY 2005	MANAGEMENT & PROGRAM ANALYSIS OFF	1
FY 2005	MANAGEMENT ANALYSIS OFFCR	1
FY 2005	MANAGEMENT ANALYST	4
FY 2005	MANAGEMENT ASSISTANT (OA)	1
FY 2005	MANAGEMENT INFORMATION SPECIALIST	2
FY 2005	MATHEMATICAL STATISTICIAN	1
FY 2005	MEMBER,EQUAL EMPLOY OPPTY COMM	2
FY 2005	OFFICE AUTOMATION ASSISTANT	2
FY 2005	OPERATIONS & POLICY SPECIALIST	2
FY 2005	PARALEGAL SPECIALIST	5
FY 2005	POLICY ANALYST	1
FY 2005	PROGRAM ANALYSIS OFFICER	1
FY 2005	PROGRAM ANALYST	53
FY 2005	PROGRAM ASSISTANT (OA)	9
FY 2005	PROGRAM MANAGER	4
FY 2005	PROGRAM SPECIALIST	4
FY 2005	PUBLIC AFFAIRS SPECIALIST	4
FY 2005	READING ASSISTANT (OA)	1
FY 2005	RESEARCH ANALYST	3

FY 2005	RESEARCH ASSISTANT	1
FY 2005	SECRETARY (OA)	25
FY 2005	SECRETARY (STENOGRAPHY)	1
FY 2005	SECURITY SPECIALIST	2
FY 2005	SENIOR OPERATING ACCOUNTANT	1
FY 2005	SOC SCIENCE RESEARCH ANALYST	1
FY 2005	SOCIAL SCIENCE RESEARCH SPECIALST	1
FY 2005	SPACE MANAGEMENT ANALYST	2
FY 2005	STAFF ASSISTANT	1
FY 2005	STAFF SPECIALIST	1
FY 2005	STATISTICIAN (GENERAL)	1
FY 2005	STRATEGIC POLICY & PLANNING	1
FY 2005	SUPERVISORY ATTORNEY-ADVISOR (CR)	4
FY 2005	SUPERVISORY ATTORNEY-ADVISOR (LABOR)	1
FY 2005	SUPERVISORY EQUAL EMPLOYMENT SPEC	2
FY 2005	SUPERVISORY GENERAL ATTORNEY (CR)	18
FY 2005	SUPERVISORY INFORMATION TECHNOLOGY	9
FY 2005	SUPERVISORY LIBRARIAN	1
FY 2005	SUPERVISORY SURVEY SPECIALIST	1
FY 2005	SUPERVISORY TRIAL ATTORNEY (CR)	4
FY 2005	SUPPORT SERVICES SPECIALIST	1
FY 2005	SUPPORT SERVICES SUPERVISOR	1
FY 2005	SUPVRY SOCIAL SCIENCE RESEARCH SPEC	1
FY 2005	SUPVY HUMAN RESOURCES SPECIALIST	2
FY 2005	SUPVY INFORMATION TECHNOLOGY SPEC.	1
FY 2005	SUPVY MANAGEMENT ANALYST	2
FY 2005	SUPVY PROCUREMENT ANALYST	1
FY 2005	SUPVY PROGRAM ANALYST	4
FY 2005	SYSTEMS ACCOUNTANT	3
FY 2005	TECHNICAL SPECIALIST	1
FY 2005	TELECOMMUNICATIONS ASSISTANT	1
FY 2005	TELECOMMUNICATIONS OFFICER	1
FY 2005	TELECOMMUNICATIONS SPECIALIST	1
FY 2005	TRAFFIC MANAGEMENT SPECIALIST	1
FY 2005	TRIAL ATTORNEY (CR)	6
FY 2005	VICE CHAIR, EQUAL EMPLOY OPPOR COMM	1
FY 2005	**Total**	**533**
FY 2006	ACCOUNTANT	4
FY 2006	ACCOUNTING OFFICER	1
FY 2006	ADMINISTRATIVE OFFICER	4
FY 2006	ADMINISTRATIVE SPECIALIST	2
FY 2006	ADMINISTRATIVE STAFF ASSISTANT	3
FY 2006	ADMINISTRATIVE STAFF ASST.	1
FY 2006	ADMINISTRATIVE SUPPORT ASSISTANT	1
FY 2006	ASSISTANT GENERAL COUNSEL (CR)	3
FY 2006	ASSOCIATE GENERAL COUNSEL FOR LMS	1
FY 2006	ASSOCIATE LEGAL COUNSEL	1
FY 2006	ATTORNEY - ADVISOR	1
FY 2006	ATTORNEY ADVISOR(CIVIL RIGHTS)	4
FY 2006	ATTORNEY-ADVISER (LABOR)	1
FY 2006	ATTORNEY-ADVISOR (CR)	48
FY 2006	ATTORNEY-EXAMINER (CR)	1
FY 2006	AUDITOR	2
FY 2006	BUDGET ANALYST	3
FY 2006	BUDGET OFFICER	1
FY 2006	CHAIR, EQUAL EMPLOY OPPTY COMM	1
FY 2006	CHIEF FINANCIAL OFFICER & DIRECTOR OF	1
FY 2006	CHIEF HUMAN CAPITAL OFFICER	1
FY 2006	CLAIMS OFFICER	1
FY 2006	COMPUTER ASSISTANT	1
FY 2006	CONFIDENTIAL SUPPORT ASSISTANT	1
FY 2006	CONGRESSIONAL LIAISON SPECIALIST	4

FY 2006	CONSULTANT	1
FY 2006	CONTRACT SPECIALIST	5
FY 2006	CRIMINAL INVESTIGATOR	2
FY 2006	DEPUTY DIRECTOR	1
FY 2006	DEPUTY GENERAL COUNSEL	1
FY 2006	DEPUTY INSPECTOR GENERAL	1
FY 2006	DIR,OFF OF FEDERAL OPERATIONS	1
FY 2006	DIRECTOR, COMMUNICATIONS STAFF	1
FY 2006	DIRECTOR, LEGISLATIVE AFFAIRS STAFF	1
FY 2006	DIRECTOR, OFFICE OF FIELD PROGRAMS	1
FY 2006	DOCUMENT CONTROL CLERK	7
FY 2006	ECONOMIST	1
FY 2006	EMPLOYMENT DATA TECHNICIAN (OA)	2
FY 2006	EMPLOYMENT SURVEY PROGRAM SPECIALIST	1
FY 2006	EQUAL EMPLOYMENT ASSISTANT (OA)	1
FY 2006	EQUAL EMPLOYMENT MANAGER	1
FY 2006	EQUAL EMPLOYMENT SPECIALIST	9
FY 2006	EQUAL OPPORTUNITY ASSISTANT (OA)	9
FY 2006	EQUAL OPPORTUNITY ASST	2
FY 2006	EVALUATOR	1
FY 2006	FINANCIAL MANAGER	1
FY 2006	FINANCIAL TECHNICIAN	1
FY 2006	FINANCIAL TECHNICIAN (OA)	2
FY 2006	GENERAL ATTORNEY (CR)	84
FY 2006	GENERAL COUNSEL	1
FY 2006	HUMAN CAPITAL STRATEGY COORDINATOR	1
FY 2006	HUMAN RESOURCES ASSISTANT (OA)	1
FY 2006	HUMAN RESOURCES ASST (EMP BENEFITS)	1
FY 2006	HUMAN RESOURCES SPEC (CLASSIFICATION)	1
FY 2006	HUMAN RESOURCES SPEC (EMP BENEFITS)	1
FY 2006	HUMAN RESOURCES SPEC (PERF MGMNT)	1
FY 2006	HUMAN RESOURCES SPECIALIST	9
FY 2006	HUMAN RESOURCES SPECIALIST (TRG)	2
FY 2006	INFO TECH SPEC (NETWORK SERV)	1
FY 2006	INFORMATION LIAISON ASSISTANT	1
FY 2006	INFORMATION SPECIALIST	5
FY 2006	INFORMATION TECH SPEC (APPSW)	2
FY 2006	INFORMATION TECHNOLOGY SPECIALIST	25
FY 2006	INSPECTOR GENERAL	1
FY 2006	INTERPRETER	3
FY 2006	INVESTIGATOR	1
FY 2006	IT SPECIALIST (CUSTSPT)	2
FY 2006	IT SPECIALIST (DATAMGT)	2
FY 2006	IT SPECIALIST (INET)	3
FY 2006	IT SPECIALIST(PROJECT MANAGER)	1
FY 2006	LABOR ECONOMIST	1
FY 2006	LEAD HUMAN RESOURCES SPEC	1
FY 2006	LEAD OPPORTUNITY ASST	1
FY 2006	LEGAL TECHNICIAN (OA)	1
FY 2006	LIBRARIAN	1
FY 2006	MANAGEMENT & PROG ANALYST	2
FY 2006	MANAGEMENT & PROGRAM ANALYSIS OFF	1
FY 2006	MANAGEMENT ANALYSIS OFFCR	1
FY 2006	MANAGEMENT ANALYST	4
FY 2006	MANAGEMENT ASSISTANT (OA)	1
FY 2006	MATHEMATICAL STATISTICIAN	1
FY 2006	MEMBER,EQUAL EMPLOY OPPTY COMM	2
FY 2006	NATIONAL MEDIATION EXEC. ADVISOR	1
FY 2006	OFFICE AUTOMATION ASSISTANT	2
FY 2006	OFFICE AUTOMATION CLERK	1
FY 2006	OPERATION SERVICES TECHNICIAN	1
FY 2006	OPERATIONS & POLICY SPECIALIST	2
FY 2006	PARALEGAL SPECIALIST	1

FY 2006	PROGRAM ANALYSIS OFFICER	1
FY 2006	PROGRAM ANALYST	49
FY 2006	PROGRAM ASSISTANT	1
FY 2006	PROGRAM ASSISTANT (OA)	4
FY 2006	PROGRAM MANAGER	4
FY 2006	PROGRAM SPECIALIST	4
FY 2006	PSYCHOLOGIST	1
FY 2006	PUBLIC AFFAIRS SPECIALIST	5
FY 2006	READING ASSISTANT (OA)	1
FY 2006	RESEARCH ANALYST	1
FY 2006	RESEARCH ASSISTANT	1
FY 2006	SECRETARY (OA)	18
FY 2006	SECRETARY (STENOGRAPHY)	1
FY 2006	SECURITY SPECIALIST	2
FY 2006	SENIOR ADVISOR	1
FY 2006	SENIOR OPERATING ACCOUNTANT	1
FY 2006	SOC SCIENCE RESEARCH ANALYST	1
FY 2006	SOCIAL SCIENCE RESEARCH SPECIALST	1
FY 2006	SPACE MANAGEMENT ANALYST	2
FY 2006	STAFF SPECIALIST	1
FY 2006	STATISTICIAN (GENERAL)	1
FY 2006	STRATEGIC POLICY & PLANNING	1
FY 2006	SUPERVISORY ATTORNEY-ADVISOR (CR)	4
FY 2006	SUPERVISORY ATTORNEY-ADVISOR (LABOR)	1
FY 2006	SUPERVISORY GENERAL ATTORNEY (CR)	15
FY 2006	SUPERVISORY INFORMATION TECHNOLOGY	9
FY 2006	SUPERVISORY LIBRARIAN	1
FY 2006	SUPERVISORY TRIAL ATTORNEY (CR)	3
FY 2006	SUPPORT SERVICES SUPERVISOR	1
FY 2006	SUPVRY SOCIAL SCIENCE RESEARCH SPEC	1
FY 2006	SUPVY HUMAN RESOURCES SPECIALIST	2
FY 2006	SUPVY INFORMATION TECHNOLOGY SPEC.	1
FY 2006	SUPVY MANAGEMENT ANALYST	1
FY 2006	SUPVY PROCUREMENT ANALYST	1
FY 2006	SUPVY PROGRAM ANALYST	4
FY 2006	SYSTEMS ACCOUNTANT	3
FY 2006	TELECOMMUNICATIONS ASSISTANT	1
FY 2006	TELECOMMUNICATIONS OFFICER	1
FY 2006	TELECOMMUNICATIONS SPECIALIST	1
FY 2006	TRAFFIC MANAGEMENT SPECIALIST	1
FY 2006	TRIAL ATTORNEY (CR)	3
FY 2006	VICE CHAIR, EQUAL EMPLOY OPPOR COMM	1
FY 2006	**Total**	**476**
FY 2007	ACCOUNTANT	4
FY 2007	ACCOUNTING OFFICER	1
FY 2007	ADMINISTRATIVE ASSISTANT	2
FY 2007	ADMINISTRATIVE OFFICER	4
FY 2007	ADMINISTRATIVE SERVICES MANAGER	1
FY 2007	ADMINISTRATIVE SPECIALIST	2
FY 2007	ADMINISTRATIVE STAFF ASSISTANT	2
FY 2007	ADMINISTRATIVE STAFF ASST.	1
FY 2007	ADMINISTRATIVE SUPPORT ASSISTANT	1
FY 2007	ASSISTANT GENERAL COUNSEL (CR)	3
FY 2007	ASSOCIATE GENERAL COUNSEL FOR LMS	1
FY 2007	ASSOCIATE LEGAL COUNSEL	1
FY 2007	ATTORNEY - ADVISOR	2
FY 2007	ATTORNEY ADVISOR(CIVIL RIGHTS)	5
FY 2007	ATTORNEY-ADVISER (LABOR)	1
FY 2007	ATTORNEY-ADVISOR (CR)	47
FY 2007	ATTORNEY-EXAMINER (CR)	1
FY 2007	AUDITOR	2
FY 2007	BUDGET ANALYST	1

FY 2007	CHAIR, EQUAL EMPLOY OPPTY COMM	1
FY 2007	CHIEF FINANCIAL OFFICER	1
FY 2007	CHIEF HUMAN CAPITAL OFFICER	1
FY 2007	CONFIDENTIAL SUPPORT ASSISTANT	1
FY 2007	CONGRESSIONAL LIAISON SPECIALIST	4
FY 2007	CONTRACT SPECIALIST	4
FY 2007	CONTRACTING MANAGER	1
FY 2007	CRIMINAL INVESTIGATOR	2
FY 2007	DEPUTY DIRECTOR	1
FY 2007	DEPUTY GENERAL COUNSEL	1
FY 2007	DEPUTY INSPECTOR GENERAL	1
FY 2007	DIR,OFF OF FEDERAL OPERATIONS	1
FY 2007	DIRECTOR, COMMUNICATIONS STAFF	1
FY 2007	DIRECTOR, LEGISLATIVE AFFAIRS STAFF	1
FY 2007	DIRECTOR, OCLA	1
FY 2007	DIRECTOR, OFFICE OF FIELD PROGRAMS	1
FY 2007	DOCUMENT CONTROL CLERK	8
FY 2007	ECONOMIST	1
FY 2007	EMPLOYMENT DATA TECHNICIAN (OA)	2
FY 2007	EMPLOYMENT SURVEY PROGRAM SPECIALIST	1
FY 2007	EQUAL EMPLOYMENT MANAGER	1
FY 2007	EQUAL EMPLOYMENT SPECIALIST	14
FY 2007	EQUAL OPPORTUNITY ASSISTANT (OA)	7
FY 2007	EQUAL OPPORTUNITY ASST	1
FY 2007	EVALUATOR	1
FY 2007	EXECUTIVE ASSISTANT	1
FY 2007	FINANCIAL ANALYST	4
FY 2007	FINANCIAL ASSISTANT	2
FY 2007	FINANCIAL ASSISTANT (OA)	1
FY 2007	FINANCIAL MANAGER	1
FY 2007	FINANCIAL MNGR (PLANNING/SYSTEMS)	1
FY 2007	GENERAL ATTORNEY (CR)	77
FY 2007	GENERAL COUNSEL	1
FY 2007	HUMAN CAPITAL STRATEGY COORDINATOR	1
FY 2007	HUMAN RESOURCES ASST (EMP BENEFITS)	1
FY 2007	HUMAN RESOURCES SPEC (CLASSIFICATION)	1
FY 2007	HUMAN RESOURCES SPEC (EMP BENEFITS)	1
FY 2007	HUMAN RESOURCES SPEC (PERF MGMNT)	1
FY 2007	HUMAN RESOURCES SPECIALIST	8
FY 2007	HUMAN RESOURCES SPECIALIST (TRG)	2
FY 2007	INFO TECH SPEC (NETWORK SERV)	1
FY 2007	INFO TECH SPEC (SECURITY)	1
FY 2007	INFORMATION LIAISON ASSISTANT	1
FY 2007	INFORMATION SPECIALIST	3
FY 2007	INFORMATION TECH SPEC (APPSW)	2
FY 2007	INFORMATION TECHNOLOGY SPECIALIST	24
FY 2007	INSPECTOR GENERAL	1
FY 2007	INTERPRETER	3
FY 2007	IT SPECIALIST (CUSTSPT)	1
FY 2007	IT SPECIALIST (DATAMGT)	2
FY 2007	IT SPECIALIST (INET)	3
FY 2007	IT SPECIALIST(PROJECT MANAGER)	1
FY 2007	LABOR ECONOMIST	1
FY 2007	LEAD HUMAN RESOURCES SPEC	1
FY 2007	LEAD OPPORTUNITY ASST	1
FY 2007	LIBRARIAN	1
FY 2007	MANAGEMENT & PROG ANALYST	1
FY 2007	MANAGEMENT & PROGRAM ANALYSIS OFF	1
FY 2007	MANAGEMENT ANALYST	1
FY 2007	MANAGEMENT SPECIALIST	3
FY 2007	MATHEMATICAL STATISTICIAN	1
FY 2007	MEMBER,EQUAL EMPLOY OPPTY COMM	2
FY 2007	NATIONAL MEDIATION EXEC. ADVISOR	1

FY 2007	OFFICE AUTOMATION ASSISTANT	1
FY 2007	OPERATION SERVICES TECHNICIAN	1
FY 2007	OPERATIONS & POLICY SPECIALIST	2
FY 2007	PARALEGAL SPECIALIST	1
FY 2007	PROGRAM ANALYSIS OFFICER	1
FY 2007	PROGRAM ANALYST	46
FY 2007	PROGRAM ASSISTANT	1
FY 2007	PROGRAM ASSISTANT (OA)	5
FY 2007	PROGRAM MANAGER	4
FY 2007	PROGRAM SPECIALIST	2
FY 2007	PSYCHOLOGIST	1
FY 2007	PUBLIC AFFAIRS SPECIALIST	4
FY 2007	READING ASSISTANT (OA)	2
FY 2007	RESEARCH ANALYST	2
FY 2007	RESEARCH ASSISTANT	1
FY 2007	SECRETARY (OA)	15
FY 2007	SECRETARY (STENOGRAPHY)	1
FY 2007	SECURITY SPECIALIST	2
FY 2007	SENIOR ADVISOR	1
FY 2007	SOC SCIENCE RESEARCH ANALYST	1
FY 2007	SPACE & PROPERTY SPECIALIST	2
FY 2007	STAFF SPECIALIST	1
FY 2007	STATISTICIAN (GENERAL)	1
FY 2007	STRATEGIC POLICY & PLANNING	1
FY 2007	SUPERVISORY ACCOUNTANT	1
FY 2007	SUPERVISORY ATTORNEY-ADVISOR (CR)	6
FY 2007	SUPERVISORY ATTORNEY-ADVISOR (LABOR)	1
FY 2007	SUPERVISORY GENERAL ATTORNEY (CR)	14
FY 2007	SUPERVISORY INFORMATION TECHNOLOGY	9
FY 2007	SUPERVISORY LIBRARIAN	1
FY 2007	SUPERVISORY SURVEY SPECIALIST	1
FY 2007	SUPERVISORY TRIAL ATTORNEY (CR)	3
FY 2007	SUPPORT SERVICES ASST (OA)	1
FY 2007	SUPPORT SERVICES SUPERVISOR	1
FY 2007	SUPVRY SOCIAL SCIENCE RESEARCH SPEC	1
FY 2007	SUPVY CONTRACT SPECIALIST	1
FY 2007	SUPVY HUMAN RESOURCES SPECIALIST	2
FY 2007	SUPVY INFORMATION TECHNOLOGY SPEC.	1
FY 2007	SUPVY PROGRAM ANALYST	4
FY 2007	SURVEY STATISTICIAN	1
FY 2007	SYSTEMS ACCOUNTANT	2
FY 2007	SYSTEMS ANALAYST	1
FY 2007	SYSTEMS ANALYST	1
FY 2007	TECHNICAL ASSISTANT	1
FY 2007	TELECOMMUNICATIONS ASSISTANT	1
FY 2007	TELECOMMUNICATIONS OFFICER	1
FY 2007	TELECOMMUNICATIONS SPECIALIST	1
FY 2007	TRIAL ATTORNEY (CR)	2
FY 2007	VICE CHAIR, EQUAL EMPLOY OPPOR COMM	1
FY 2007	**Total**	**459**

English-Only Workplace Rules

1. **What percentage of EEOC's charge receipts allege discrimination based on English-only policies? What percent of cases that go to litigation are based on English-only policies?**

EEOC received 82,484 new charges in FY 2007. Of that number, 190 (0.23%) were English-only charges. In FY 06, there were 75,768 new receipts and 126 (0.17%) were English-only charges; in FY 05, we received 75,428 charges and of these, 141 (0.19%) were English-only charges. During the past 3 fiscal years, EEOC filed a total of 1,088 lawsuits. Of that number, 8 (0.7%) were lawsuits involving the English-only issue.

In FY 2007, the EEOC filed two lawsuits involving English-only policies. One was the Salvation Army case and the other case involved claims in addition to the English-only issue. The two suits filed in FY 2007 represented 0.6 percent of all lawsuits filed in FY 2007. This is consistent with past years. Over the last three fiscal years, cases involving challenges to English-only policies have comprised less than one percent of our total suit filings, as shown in the table below.

FY	ENGLISH-ONLY	ALL MERITS SUITS	PERCENT
2005	4	381	1.0%
2006	2	371	0.5%
2007	2	336	0.6%
	8	1088	0.7%

Most of the lawsuits EEOC files challenging the legality of rules prohibiting the use of languages other than English in the workplace also contain claims of other forms of national origin discrimination, including harassment and discriminatory terms and conditions of employment.

2. **Do you have an estimate of how much EEOC spends per year on charges based on English-only workplace rules?**

Using the figure above of 190 charges received in FY 07 involving the issue of English-only restrictions, this represents the annual workload of less than two investigators (roughly 1.8 investigators). Computing the FY 2008 annual salary, benefits, and overhead for a GS-9, Step 1 field investigator at $61,578, and calculating that against 1.8 investigators equals $110,840 spent per year on this category of charges.

REP. MICHAEL M. HONDA
QUESTIONS FOR THE RECORD
U.S. EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

Questions on Increasing Workload and Shrinking Workforce

1. **The most recent EEOC IG's Report to Congress raises serious concerns in the area of strategic management of staff. The IG stated that EEOC has not conducted adequate workforce analysis or workforce planning. What specific steps has EEOC taken to address the critical concerns of the IG regarding staffing and workforce planning?**

EEOC conducts both workforce analysis and workforce planning as a part of the annual budget process as well as a part of program management. The IG's concern was that "EEOC has not conducted adequate workforce analysis or workforce planning necessary to determine the degree to which budget or other issues, such as organizational structure and efficiency, impact mission accomplishment."

We are examining an integrated approach through which EEOC:

- examines the fundamental assumptions about how work is done, who should do it, and make needed adjustments;
- conducts time and cost studies of the mission critical functions to use as a baseline against which future improvements and efficiencies can be measured;
- undertakes workflow analyses of its major functions to ensure the work design best serves the agency mission, is efficient and is cost effective;
- evaluates the work process and identifies processes that do and do not support the agency mission, reducing wasted efforts and resources; eliminating duplication and redundancy of jobs and functions; improving customer service by identifying gaps in services; and facilitating effective HR planning by documenting the current work process framework; and
- embraces position management to ensure that those performing our mission are assigned to jobs that are properly classified and graded.

These initiatives are under discussion and study. We expect a final decision on their implementation by September 30, 2008.

2. **What succession planning has been implemented?**

The agency has developed a succession planning framework document to guide the development of its efforts to prepare the next generation of leaders. This plan was developed in collaboration with OPM using their recommended succession planning model. As part of the planning process, EEOC analyzed its workforce demographics and determined that on average, employees stay at the agency about 4 years past retirement eligibility. We have also looked at our leadership and mission critical occupations to determine when, as individual occupational groups, they will become retirement eligible.

In particular, the agency has begun to focus on the executive level first in its assessment of leadership strength and continuity. Since 2004, we have assessed our executives and field and program managers at the GS-15 level using a 360 degree leadership assessment instruments in collaboration with the USDA Graduate School. Last year we also participated in a leadership assessment survey sponsored by OPM for supervisors and managers. Each year we provide training opportunities for the members of the SES and experienced GS-15 managers to attend the highly regarded Leadership for a Democratic Society Program offered by the Federal Executive Institute. As part of our succession planning efforts, we revised the selection process for allocation of spaces for participation in this program to include more managers at the GS-15 level who demonstrate high leadership potential.

We have provided additional training and executive development opportunities for the members of the SES through customized courses through the Federal Executive Institute as well. We also provided SES with IDPs using on-line courses offered by Harvard.

The Executive Resources Board (ERB) is active in the succession planning effort and has endorsed the succession planning framework. We are currently developing a formal succession planning implementation plan that will also require ERB commitment and endorsement. This plan will be completed by August 31, 2008.

3. **What new recruiting and retention strategies have been put into place to address the issues of the aging EEOC workforce? Please submit for the record a list of every permanent hire made since 2006, including the date of hire, the position for which they were hired, the position they currently hold, a description of their positions, and the office to which they are assigned.**

The mission of the EEOC presents a powerful magnet to attract new people into our workforce. That reality coupled with the fact that our employees tend to stay employed with the agency past their retirement eligibility has resulted in highly motivated workers led and trained by seasoned professionals. This sets up an excellent dynamic for mentoring and developing our new employees. EEOC is a labor intensive organization and much of its budget is devoted to support its human capital. Recruitment and retention strategies available to other agencies with larger budgets are not as readily available and to date, not proven to be a requirement. This helps ensure that the individuals we do hire have the necessary skills to do the job. We actively search for new entrants through job fairs and, as resources permit, the implementation of a Federal Career Intern program. We are also focusing our resources on improved training, especially for investigators, mediators and attorneys. Finally, we use awards, both formal and informal, as well as details to other positions for development and upward mobility/staff development programs for retention. The Chair created the Excellence in Leadership Awards (ELA) program to recognize and reward employees at all levels for their leadership contributions.

We have provided as **Attachment I** a list of the 260 new hires made since 2006, including the date of hire, and the position for which they were hired, the position they currently hold, and the office to which they are assigned. A description of each position is also attached.
(the committee will keep this on file)

4. **Why did the EEOC end FY07 with approximately 244 FTEs fewer than was requested in its FY07 budget request?**

The final FY 2007 appropriation required changes to be made in the operating plan that was developed with the budget submission. The following table explains the budget items and adjustments to the operating plan to show why EEOC was unable to hire to our 2,381 FTE ceiling.

- 1.28% Congressional rescission	**$4,227,000**
- Fund 50% of the pay adjustment 1.1%	**1,748,000**
- Fund annualization of FY 2006 pay raise 3.1%	**900,000**
- Finance relocation of HQ and WFO offices	**7,500,000**
- State and local reimbursements	**2,000,000**
- Operate National Contact Center	**2,700,000**
- Carry forward promotions above the full performance level	**1,000,000**
- Within grades and career ladder promotions	**1,000,000**
- Subsidized Headquarters' office parking	**450,000**
- HSPD-12 biometric ID cards	**350,000**
- DHS security contracts	**200,000**
- Library subscriptions	**150,000**
- Systemic litigation support	**150,000**
- Transit subsidy for 14 field offices	**100,000**
- New hires - hired above entry level grade	**100,000**
- EEO surveys	**100,000**
- Other general increases (travel, copiers, delivery, gov't cars, etc.)	**800,000**
	$23,475,000

5. **The budget request for FY09 includes 109 new hires to address the backlog of private-sector charges. Are 109 hires sufficient given the rapidly growing backlog at EEOC?**

Currently we plan on hiring 75 permanent investigators and 6 permanent mediators in our field offices. The remaining 28 positions will be used to fill positions where we feel we have the greatest need throughout the agency.

Filling these front-line positions will allow EEOC to slow down the rate of increase in our inventory. We believe these resources are sufficient.

ATTACHMENT I

05/02/08

NEW HIRES SINCE 10/01/06

Date Of Hires	Hire Position	Current Position	Office	Total
10/01/06	INVESTIGATOR	INVESTIGATOR	CINCINNATI AO	1
10/01/06	PROGRAM MANAGER	PROGRAM MANAGER	HOUSTON DO	1
10/01/06	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	CINCINNATI AO	1
10/02/06	INVESTIGATOR	INVESTIGATOR	CINCINNATI AO	1
10/02/06	OFFICE AUTOMATION ASSISTANT	LEAD INVESTIGATIVE SUPPORT ASSISTANT	TAMPA AO	1
10/02/06	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	NASHVILLE AO	1
10/02/06	INVESTIGATOR	INVESTIGATOR	CINCINNATI AO	1
10/16/06	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	PHOENIX DO	1
10/16/06	OFFICE AUTOMATION ASSISTANT	LEAD INVESTIGATIVE SUPPORT ASSISTANT	INDIANAPOLIS DO	1
10/16/06	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	CHICAGO DO	1
10/16/06	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	PHOENIX DO	1
10/16/06	ATTORNEY EXAMINER (CR)	ATTORNEY EXAMINER (CR)	NEW YORK DO	1
10/16/06	OFFICE AUTOMATION ASSISTANT	NOT EMPLOYED	MIAMI DO	1
10/16/06	ADMINISTRATIVE ASSISTANT	NOT EMPLOYED	HUMAN RESOURCES	1
10/27/06	INVESTIGATOR (BILINGUAL-SPANISH)	NOT EMPLOYED	CHICAGO DO	1
10/30/06	ACCOUNTANT	NOT EMPLOYED	FINANCIAL	1
10/30/06	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	ST. LOUIS DO	1
10/30/06	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	ST. LOUIS DO	1
10/30/06	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	MIAMI DO	1
10/30/06	POLICY ANALYST	NOT EMPLOYED	OFFICE OF THE CHAIR	1
11/13/06	LEGAL CLERK (OA)	LEGAL CLERK (OA)	PHOENIX DO	1
11/13/06	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	PHILADELPHIA DO	1
11/26/06	PROGRAM ASSISTANT (OA)	PROGRAM ASSISTANT (OA)	NEWARK AO	1
11/27/06	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	CHICAGO DO	1
11/27/06	INVESTIGATOR (BILINGUAL-MANDARIN)	INVESTIGATOR (BILINGUAL-MANDARIN)	CHICAGO DO	1
12/10/06	ADMINISTRATIVE ASST (OA)	ADMINISTRATIVE ASSISTANT	CHIEF FINANCIAL	1
12/10/06	LEGAL TECHNICIAN (OA)	NOT EMPLOYED	NEW YORK DO	1
12/10/06	INVESTIGATOR (BILINGUAL-SPANISH)	NOT EMPLOYED	KANSAS CITY AO	1
12/11/06	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	PHOENIX DO	1
12/11/06	OFF AUTO ASST (BILINGUAL-SPANISH)	OFF AUTO ASST (BILINGUAL-SPANISH)	EL PASO AO	1
12/11/06	INVESTIGATOR (BILINGUAL-MANDARIN)	NOT EMPLOYED	CHICAGO DO	1
12/11/06	LEGAL TECHNICIAN (OA)	LEGAL TECHNICIAN (OA)	PHILADELPHIA DO	1
12/18/06	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	CHARLOTTE DO	1
12/24/06	OFF AUTO ASST (BILINGUAL-SPANISH)	OFF AUTO ASST (BILINGUAL-SPANISH)	DALLAS DO	1
12/26/06	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	NEW YORK DO	1
12/26/06	INVESTIGATOR	INVESTIGATOR	INDIANAPOLIS DO	1
12/26/06	OFFICE AUTOMATION CLERK	OFFICE AUTOMATION ASSISTANT	PHILADELPHIA DO	1
01/07/07	INVESTIGATOR	INVESTIGATOR	BALTIMORE FO	1
01/07/07	INVESTIGATOR	INVESTIGATOR	INDIANAPOLIS DO	1
01/08/07	INVESTIGATOR	INVESTIGATOR	INDIANAPOLIS DO	1
01/08/07	TRIAL ATTORNEY (CR)	SUPERVISORY TRIAL ATTORNEY (CR)	MIAMI DO	1
01/08/07	OFFICE AUTOMATION CLERK	OFFICE AUTOMATION CLERK	RICHMOND LO	1

01/08/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	CHICAGO DO	1
01/08/07	INVESTIGATOR	INVESTIGATOR	INDIANAPOLIS DO	1
01/08/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	CHICAGO DO	1
01/08/07	SECRETARY (OA)	SECRETARY (OA)	GENERAL COUNSEL	1
01/08/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	CHICAGO DO	1
01/08/07	INVESTIGATOR (BILINGUAL-POLISH)	INVESTIGATOR (BILINGUAL-POLISH)	CHICAGO DO	1
01/14/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	PHOENIX DO	1
01/22/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	GREENVILLE LO	1
01/22/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	GREENSBORO LO	1
01/22/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	GREENSBORO LO	1
01/22/07	INVESTIGATOR (BILINGUAL-SPANISH)	NOT EMPLOYED	RICHMOND LO	1
01/22/07	INVESTIGATOR	INVESTIGATOR	GREENSBORO LO	1
01/22/07	DISTRICT RESOURCE MANAGER	NOT EMPLOYED	DALLAS DO	1
02/04/07	INVESTIGATOR	INVESTIGATOR	SAVANNAH LO	1
02/04/07	INVESTIGATOR (BILINGUAL-SPANISH)	NOT EMPLOYED	RICHMOND LO	1
02/04/07	INVESTIGATOR	INVESTIGATOR	NEW YORK DO	1
02/05/07	INVESTIGATOR	INVESTIGATOR SUPPORT ASSISTANT (OA)	ATLANTA DO	1
02/05/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	ATLANTA DO	1
02/05/07	OFFICE AUTOMATION CLERK	NOT EMPLOYED	PHILADELPHIA DO	1
02/05/07	TRIAL ATTORNEY (CR)	NOT EMPLOYED	MIAMI DO	1
02/05/07	INVESTIGATOR	INVESTIGATOR	ATLANTA DO	1
02/05/07	INVESTIGATOR	INVESTIGATOR	ATLANTA DO	1
02/18/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	ATLANTA DO	1
02/20/07	INVESTIGATOR	INVESTIGATOR	PHOENIX DO	1
02/20/07	INVESTIGATOR	INVESTIGATOR	ALBUQUERQUE AO	1
02/20/07	INVESTIGATOR	NOT EMPLOYED	CHICAGO DO	1
02/20/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	ATLANTA DO	1
02/21/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	NORFOLK LO	1
03/04/07	INVESTIGATOR	INVESTIGATOR	CHARLOTTE DO	1
03/05/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	BUFFALO LO	1
03/19/07	INVESTIGATOR	INVESTIGATOR	MINNEAPOLIS AO	1
03/19/07	OFFICE AUTOMATION CLERK	OFFICE AUTOMATION CLERK	MINNEAPOLIS AO	1
03/19/07	INVESTIGATOR	NOT EMPLOYED	MINNEAPOLIS AO	1
03/19/07	INVESTIGATOR	INVESTIGATOR	ALBUQUERQUE AO	1
03/19/07	INVESTIGATOR	INVESTIGATOR	PHOENIX DO	1
04/01/07	SURVEY STATISTICIAN	SURVEY STATISTICIAN	ORIP	1
04/02/07	DIRECTOR, OCLA	DIRECTOR, OCLA	OCLA	1
04/04/07	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	BALTIMORE FO	1
04/03/07	CONSULTANT	NOT EMPLOYED	INF OTECH	1
04/15/07	INVESTIGATOR	INVESTIGATOR	SEATTLE FO	1
04/15/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	EL PASO AO	1
04/29/07	INVESTIGATOR	INVESTIGATOR	DETROIT FO	1
04/29/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	SAN ANTONIO FO	1
04/29/07	DISTRICT RESOURCES MANAGER	DISTRICT RESOURCES MANAGER	MIAMI DO	1
04/29/07	INVESTIGATOR	INVESTIGATOR	SAN ANTONIO FO	1

04/30/07	INVESTIGATOR	INVESTIGATOR	WASHINGTON FO	1
04/30/07	INVESTIGATOR	INVESTIGATOR	WASHINGTON FO	1
04/30/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	DETROIT FO	1
04/30/07	INVESTIGATOR	INVESTIGATOR	WASHINGTON FO	1
04/30/07	INVESTIGATOR	INVESTIGATOR	SAN ANTONIO FO	1
04/30/07	INVESTIGATOR	INVESTIGATOR	DETROIT FO	1
05/13/07	DISTRICT RESOURCES MANAGER	DISTRICT RESOURCES MANAGER	PHOENIX DO	1
05/13/07	GENERAL ATTORNEY (CR)	GENERAL ATTORNEY (CR)	FEDERAL OPERATIONS	1
05/14/07	READING ASSISTANT (OA)	READING ASSISTANT (OA)	MINNEAPOLIS AO	1
05/14/07	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	LOS ANGELES DO	1
05/14/07	INFORMATION TECHNOLOGY SPECIALIS	INFORMATION TECHNOLOGY SPECIALIST	CHICAGO DO	1
05/14/07	INVESTIGATOR	INVESTIGATOR	ST. LOUIS DO	1
05/14/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	NASHVILLE AO	1
05/14/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	MIAMI DO	1
05/14/07	INVESTIGATOR	INVESTIGATOR	LITTLE ROCK AR	1
05/14/07	INVESTIGATOR	INVESTIGATOR	NEW YORK DO	1
05/14/07	INVESTIGATOR	INVESTIGATOR	MEMPHIS DO	1
05/14/07	INVESTIGATOR	INVESTIGATOR	WASHINGTON FO	1
05/27/07	FINANCIAL MANAGER	FINANCIAL MANAGER	CHIEF FINANCIAL	1
05/27/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	SAN ANTONIO FO	1
05/27/07	INVESTIGATOR (BILINGUAL-POLISH)	INVESTIGATOR (BILINGUAL-POLISH)	CHICAGO DO	1
05/29/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	SAN FRANCISCO DO	1
05/29/07	INVESTIGATOR (BILINGUAL-VIETNAMESE	NOT EMPLOYED	SAN JOSE LO	1
05/29/07	OFFICE AUTOMATION ASSISTANT	LEAD INVESTIGATIVE SUPPORT ASSISTANT	OKALAHOMA AO	1
06/10/07	DISTRICT RESOURCES MANAGER	DISTRICT RESOURCES MANAGER	NEW YORK DO	1
06/11/07	INVESTIGATOR (BILINGUAL-POLISH)	INVESTIGATOR (BILINGUAL-POLISH)	CHICAGO DO	1
06/11/07	INVESTIGATOR	INVESTIGATOR	PHOENIX DO	1
06/11/07	INVESTIGATOR (BILINGUAL-SPANISH)	NOT EMPLOYED	MOBILE LO	1
06/11/07	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	HOUSTON DO	1
06/11/07	LEGAL TECHNICIAN (OA)	LEGAL TECHNICIAN (OA)	LOS ANGELES DO	1
06/24/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	NASHVILLE AO	1
06/24/07	DISTRICT RESOURCES MANAGER	DISTRICT RESOURCES MANAGER	MEMPHIS DO	1
06/25/07	SUPERVISORY INVESTIGATOR	SUPERVISORY INVESTIGATOR	PHOENIX DO	1
06/25/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	ST. LOUIS DO	1
07/08/07	INVESTIGATOR	INVESTIGATOR	DETROIT FO	1
07/09/07	DISTRICT RESOURCES MANAGER	DISTRICT RESOURCES MANAGER	BIRMINGHAM DO	1
07/09/07	DISTRICT RESOURCES MANAGER	DISTRICT RESOURCES MANAGER	ATLANTA DO	1
07/23/07	OFFICE AUTOMATION CLERK	OFFICE AUTOMATION CLERK	CHICAGO DO	1
07/23/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	SAN FRANCISCO DO	1
07/23/07	ADMINISTRATIVE STAFF ASSISTANT	ADMINISTRATIVE STAFF ASSISTANT	OFFICE OF THE CHAIR	1
07/23/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	SAN FRANCISCO DO	1
07/23/07	INVESTIGATOR	INVESTIGATOR	WASHINGTON FO	1
07/27/07	ATTORNEY EXAMINER (CR)	ATTORNEY EXAMINER (CR)	ATLANTA DO	1
08/05/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	CHICAGO DO	1
08/05/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	LOS ANGELES DO	1

08/05/07	INVESTIGATOR	INVESTIGATOR	NEWARK AO	1
08/05/07	INVESTIGATOR	INVESTIGATOR	NEW YORK DO	1
08/06/07	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	TAMPA AO	1
08/06/07	OFFICE AUTOMATION CLERK	OFFICE AUTOMATION CLERK	CHICAGO DO	1
08/06/07	INVESTIGATOR	INVESTIGATOR (BILINGUAL-SPANISH)	WASHINGTON FO	1
08/06/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	FRESNO LO	1
08/06/07	LEGAL TECHNICIAN (OA)	DISTRICT RESOURCES MANAGEMENT ASST	EL PASO AO	1
08/06/07	OFF AUTO ASST (BILINGUAL-SPANISH)	OFF AUTO ASST (BILINGUAL-SPANISH)	CHICAGO DO	1
08/06/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	INDIANAPOLIS DO	1
08/06/07	OFFICE AUTOMATION ASSISTANT	CONTROL CLERK (OA)	PHILADELPHIA DO	1
08/06/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	INDIANAPOLIS DO	1
08/20/07	SUPERVISORY TRIAL ATTORNEY (CR)	SUPERVISORY TRIAL ATTORNEY (CR)	ATLANTA DO	1
08/20/07	INVESTIGATOR	INVESTIGATOR	PHILADELPHIA DO	1
08/20/07	PROGRAM ANALYST	PROGRAM ANALYST	WASHINGTON FO	1
08/20/07	DOCUMENT CONTROL CLERK	NOT EMPLOYED	FEDERAL OPERATIONS	1
08/27/07	PARALEGAL SPECIALIST	PARALEGAL SPECIALIST	LOS ANGELES DO	1
09/03/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	NEW YORK DO	1
09/04/07	LAW CLERK	TRIAL ATTORNEY (CR)	MINNEAPOLIS AO	1
09/04/07	OFFICE AUTOMATION ASSISTANT	NOT EMPLOYED	KANSAS CITY AO	1
09/16/07	SECRETARY (OA)	SECRETARY (OA)	PHILADELPHIA DO	1
09/16/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	INDIANAPOLIS DO	1
09/16/07	SUPERVISORY INVESTIGATOR	SUPERVISORY INVESTIGATOR	BIRMINGHAM DO	1
09/16/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	KANSAS CITY AO	1
09/17/07	LEGAL TECHNICIAN (OA)	NOT EMPLOYED	NEW YORK DO	1
09/17/07	INVESTIGATOR	INVESTIGATOR	ATLANTA DO	1
09/17/07	OFFICE AUTOMATION ASSISTANT	NOT EMPLOYED	LITTLE ROCK AR	1
09/17/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	KANSAS CITY AO	1
09/17/07	INVESTIGATOR	INVESTIGATOR	INDIANAPOLIS DO	1
09/17/07	LEGAL CLERK	LEGAL CLERK	PHILADELPHIA DO	1
09/17/07	LAW CLERK	LAW CLERK	DALLAS DO	1
09/17/07	INVESTIGATOR	LEAD INVEST SUPP ASST (BILING/SPAN)	ALBUQUERQUE AO	1
09/24/07	LAW CLERK	TRIAL ATTORNEY (CR)	CHARLOTTE DO	1
09/24/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	RICHMOND LO	1
09/30/07	HUMAN RESOURCES SPECIALIST	HUMAN RESOURCES SPECIALIST	HUMAN RESOURCES	1
09/30/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	ATLANTA DO	1
TOTAL				**167**
10/01/07	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	LITTLE ROCK AR	1
10/01/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	MOBILE LO	1
10/01/07	INVESTIGATOR	NOT EMPLOYED	LITTLE ROCK AR	1
10/01/07	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	MIAMI DO	1
10/01/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	NASHVILLE AO	1
10/03/07	INVESTIGATOR	INVESTIGATOR	ALBUQUERQUE AO	1
10/09/07	SECRETARY (OA)	SECRETARY (OA)	CHARLOTTE DO	1
10/14/07	INVESTIGATOR	INVESTIGATOR	MEMPHIS DO	1

10/15/07	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	ATLANTA DO	1
10/28/07	INVESTIGATOR	INVESTIGATOR	PHOENIX DO	1
10/28/07	LABOR ECONOMIST	LABOR ECONOMIST	ORIP	1
10/28/07	INVESTIGATOR	INVESTIGATOR	PHOENIX DO	1
10/29/07	DISTRICT RESOURCES MANAGEMENT A	DISTRICT RESOURCES MANAGEMENT ASST	LOS ANGELES DO	1
10/29/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	NEW ORLEANS FO	1
10/29/07	INVESTIGATOR	NOT EMPLOYED	MIAMI DO	1
10/29/07	INVESTIGATOR	INVESTIGATOR	PHOENIX DO	1
10/29/07	INVESTIGATOR (BILINGUAL-CANTONESE	INVESTIGATOR (BILINGUAL-CANTONESE)	SAN FRANCISCO DO	1
10/29/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	LITTLE ROCK AR	1
10/29/07	INVESTIGATOR (BILINGUAL-SPANISH)	NOT EMPLOYED	MEMPHIS DO	1
10/29/07	DISTRICT RESOURCES MANAGEMENT A	DISTRICT RESOURCES MANAGEMENT ASST	PHOENIX DO	1
11/01/07	INVESTIGATOR	INVESTIGATOR	ALBUQUERQUE AO	1
11/11/07	SECRETARY (OA)	SECRETARY (OA)	MIAMI DO	1
11/11/07	OFF AUTO ASST (BILINGUAL-SPANISH)	OFF AUTO ASST (BILINGUAL-SPANISH)	MIAMI DO	1
11/11/07	DISTRICT RESOURCES MANAGEMENT A	DISTRICT RESOURCES MANAGEMENT ASST	CHARLOTTE DO	1
11/13/07	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	NEWARK AO	1
11/13/07	ADMINISTRATIVE STAFF ASSISTANT	ADMINISTRATIVE STAFF ASSISTANT	VICE CHAIR	1
11/13/07	READING ASSISTANT (OA)	READING ASSISTANT (OA)	RICHMOND LO	1
11/13/07	LEGAL COUNSEL	LEGAL COUNSEL	LEGAL COUNSEL	1
11/13/07	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	DENVER FO	1
11/19/07	INVESTIGATOR	INVESTIGATOR	HOUSTON DO	1
11/26/07	INVESTIGATOR	INVESTIGATOR	NASHVILLE AO	1
11/26/07	OFF AUTO ASST (BILINGUAL-SPANISH)	OFF AUTO ASST (BILINGUAL-SPANISH)	EL PASO AO	1
12/10/07	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	LAS VEGAS LO	1
12/10/07	DISTRICT RESOURCES MANAGEMENT A	DISTRICT RESOURCES MANAGEMENT ASST	CHICAGO DO	1
01/07/08	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	KANSAS CITY AO	1
01/07/08	ADR MEDIATOR	ADR MEDIATOR	OKALAHOMA AO	1
01/07/08	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	SAN FRANCISCO DO	1
01/07/08	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	SAN DIEGO AO	1
01/07/08	OFF AUTO ASST (BILINGUAL-SPANISH)	OFF AUTO ASST (BILINGUAL-SPANISH)	HOUSTON DO	1
01/07/08	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	DENVER FO	1
01/22/08	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	NEW YORK DO	1
01/22/08	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	LOS ANGELES DO	1
01/22/08	SUPVY PROGRAM ANALYST	SUPVY PROGRAM ANALYST	FIELD PROGRAMS - HQ	1
01/22/08	PROGRAM ASSISTANT (OA)	PROGRAM ASSISTANT (OA)	FIELD PROGRAMS	1
01/22/08	INVESTIGATOR	INVESTIGATOR	NEW YORK DO	1
01/22/08	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	SEATTLE FO	1
01/22/08	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	CHARLOTTE DO	1
01/28/08	SUPPORT SERVICES SPECIALIST	SUPPORT SERVICES SPECIALIST	CHIEF FINANCIAL	1
01/28/08	FINANCIAL ANALYST	FINANCIAL ANALYST	FIELD PROGRAMS	1
02/04/08	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	HOUSTON DO	1
02/04/08	PERSONAL ASSISTANT (OA)	PERSONAL ASSISTANT (OA)	HOUSTON DO	1
02/04/08	INVESTIGATOR	INVESTIGATOR	NEW YORK DO	1
02/04/08	TRAINING SPECIALIST	TRAINING SPECIALIST	KANSAS CITY AO	1

02/17/08	INVESTIGATOR	INVESTIGATOR	CHICAGO DO	1
02/19/08	INVESTIGATOR	INVESTIGATOR	DENVER FO	1
02/19/08	INVESTIGATOR (BILINGUAL-CHINESE)	INVESTIGATOR (BILINGUAL-CHINESE)	ATLANTA DO	1
02/19/08	INVESTIGATOR (BILINGUAL-KOREAN)	INVESTIGATOR (BILINGUAL-KOREAN)	ATLANTA DO	1
02/19/08	INVESTIGATOR (BILINGUAL-POLISH)	INVESTIGATOR (BILINGUAL-POLISH)	CHICAGO DO	1
02/19/08	INVESTIGATOR	INVESTIGATOR	DENVER FO	1
02/19/08	INVESTIGATOR (BILINGUAL-SPANISH)	INVESTIGATOR (BILINGUAL-SPANISH)	CHICAGO DO	1
03/02/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	ATLANTA DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	KANSAS CITY AO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	KANSAS CITY AO	1
03/03/08	LEAD INVESTIGATIVE SUPPORT ASSIST/	LEAD INVESTIGATIVE SUPPORT ASSISTANT	CHICAGO DO	1
03/03/08	LEAD INVESTIGATIVE SUPPORT ASSIST/	LEAD INVESTIGATIVE SUPPORT ASSISTANT	KANSAS CITY AO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	SEATTLE FO	1
03/03/08	LEAD INVESTIGATIVE SUPPORT ASSIST/	LEAD INVESTIGATIVE SUPPORT ASSISTANT	SEATTLE FO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	CHICAGO DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	PHOENIX DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	CHICAGO DO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	CHICAGO DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	HOUSTON DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	SEATTLE FO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	NEW YORK DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	ATLANTA DO	1
03/03/08	INVESTIGATOR SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	CHARLOTTE DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVEST SUPP ASST (BILING/SPANISH)	NEW YORK DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	TAMPA AO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	LEAD INVEST SUPP ASST (BILING/SPAN)	ATLANTA DO	1
03/03/08	LEAD INVEST SUPP ASST (BILING/SPAN)	LEAD INVEST SUPP ASST (BILING/SPAN)	LOS ANGELES DO	1
03/03/08	LEAD INVEST SUPP ASST (BILING/SPAN)	LEAD INVEST SUPP ASST (BILING/SPAN)	NEW YORK DO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	NEW YORK DO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	DALLAS DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	INDIANAPOLIS DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVEST SUPP ASST (BILING/SPANISH)	CHARLOTTE DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	LITTLE ROCK AR	1
03/03/08	INVESTIGATOR SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	PHILADELPHIA DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	PHOENIX DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	INDIANAPOLIS DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	BIRMINGHAM DO	1
03/03/08	INVEST SUP ASST (BILINGUAL-SPANISH)	INVEST SUP ASST (BILINGUAL-SPANISH)	CHARLOTTE DO	1
03/03/08	LEAD INVESTIGATIVE SUPPORT ASSIST/	LEAD INVESTIGATIVE SUPPORT ASSISTANT	BIRMINGHAM DO	1
03/03/08	INVESTIGATOR	INVESTIGATOR	CHICAGO DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	CHARLOTTE DO	1
03/03/08	LEAD INVEST SUPP ASST (BILING/SPAN)	LEAD INVEST SUPP ASST (BILING/SPAN)	HOUSTON DO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	TAMPA AO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	NOT EMPLOYED	PHILADELPHIA DO	1
03/03/08	RESEARCH LIBRARIAN	RESEARCH LIBRARIAN	ORIP	1

03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	KANSAS CITY AO	1
03/03/08	LEAD INVEST SUPP ASST (BILING/SPAN)	LEAD INVEST SUPP ASST (BILING/SPAN)	DALLAS DO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	PHOENIX DO	1
03/03/08	PROGRAM SPECIALIST	PROGRAM SPECIALIST	CHIEF FINANCIAL	1
03/03/08	OFFICE AUTOMATION ASSISTANT	OFFICE AUTOMATION ASSISTANT	ALBUQUERQUE AO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	NOT EMPLOYED	PHILADELPHIA DO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	SEATTLE FO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	DALLAS DO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	TAMPA AO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	LOS ANGELES DO	1
03/03/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	BIRMINGHAM DO	1
03/03/08	LEAD INVEST SUPP ASST (BILING/SPAN)	INVEST SUP ASST (BILINGUAL-SPANISH)	PHILADELPHIA DO	1
03/03/08	INVEST SUP ASST (BILINGUAL-SPANISH)	INVEST SUP ASST (BILINGUAL-SPANISH)	INDIANAPOLIS DO	1
03/03/08	LEAD INVESTIGATIVE SUPPORT ASSIST/	LEAD INVESTIGATIVE SUPPORT ASSISTANT	CHARLOTTE DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	LOS ANGELES DO	1
03/03/08	LEAD INVESTIGATIVE SUPPORT ASSIST/	LEAD INVESTIGATIVE SUPPORT ASSISTANT	PHOENIX DO	1
03/03/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	LITTLE ROCK AR	1
03/04/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	SEATTLE FO	1
03/05/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	LOS ANGELES DO	1
03/10/08	LEAD INVEST SUPP ASST (BILING/SPAN)	LEAD INVEST SUPP ASST (BILING/SPAN)	ATLANTA DO	1
03/11/08	INVEST SUPP ASST (BILING/SPANISH)	INVEST SUPP ASST (BILING/SPANISH)	HOUSTON DO	1
03/17/08	CHIEF INFORMATION OFFICER	CHIEF INFORMATION OFFICER	INFO TECH	1
03/17/08	TRIAL ATTORNEY (CR)	TRIAL ATTORNEY (CR)	BIRMINGHAM DO	1
03/24/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	CHARLOTTE DO	1
03/30/08	HUMAN RESOURCES SPECIALIST	HUMAN RESOURCES SPECIALIST	HUMAN RESOURCES	1
03/30/08	IT SPECIALIST (SECURITY)	IT SPECIALIST (SECURITY)	INFO TECH	1
03/31/08	ADMINISTRATIVE ASSISTANT	ADMINISTRATIVE ASSISTANT	OCLA	1
03/31/08	SUPERVISORY MANAGEMENT SPECIALI!	SUPERVISORY MANAGEMENT SPECIALIST	CHIEF FINANCIAL	1
04/14/08	INVESTIGATIVE SUPPORT ASSISTANT	INVESTIGATIVE SUPPORT ASSISTANT	KANSAS CITY AO	1
Total				**127**

***RED HIGHLIGHT NOT EMPLOYED (SEPARATED)

6. **What is EEOC's plan for hiring in FY08 and FY09, including a specification of which positions will be filled and in which offices?**

Attachment #1 to question 3 provides information on new hires through May 1, 2008. We currently have 63 authorized external hire positions in the process of being filled. Beyond this we anticipate no further new hires for the balance of FY 2008 except for some backfill of positions that become vacant. For FY 2009 we anticipate filling an additional 109 positions.

7. **How many of the new hires will be for permanent front-line field positions?**

Of the 63 current vacancies, approximately 35-40 are for front line positions. For the FY 2009 hires, a minimum of 81 will be for front line positions.

English-only cases

Last year, funding for the EEOC to prosecute cases of discrimination against language minorities was a major source contention for the CJS bill. Firstly, I believe that EEOC must protect all individuals from unfair discrimination, including language minorities. Second, I am wondering if Senator Alexander is overstating the amount of resources actually invested in prosecuting English-only cases.

1. **In the last fiscal year, how many of the charges filed with the EEOC alleged ONLY discrimination because of a "speak English-only" at the workplace policy? How many charges alleged discrimination because of an English-only policy in conjunction with other allegations of discrimination?**

In FY 2007, there were 82,484 charges filed with EEOC. Of that number, 13 (0.02%) alleged the issue of English-only and no other allegations. A total of 177 charges (0.21%) included the issue of English-only in addition to other allegations of discrimination. This resulted in a total of 190 charges (0.23%) out of our total FY 2007 receipts involved the English-only issue.

2. **Of those charges that alleged discrimination solely because of a speak English-only policy, how much money did the EEOC spend on them, both in terms of actually dollars spent as well as the cost of person-hours required? What about those charges in which the speak English-only policy was one of a number of other discriminatory acts?**

The cost of processing charges based on English-only workplace rules is difficult to quantify. However, using the figure above of 190 charges received in FY 2007 involving the issue of English-only restrictions, this represents the annual workload of less than two investigators (roughly 1.8 investigators or 3,744 hours). Computing out the FY 2008 annual salary, benefits and overhead for a GS-9/Step 1 field investigator, and calculating that against 1.8 investigators equals $110,840 spent per year on this category of charges. To further break-out these figures, the cost for processing the 13 charges which alleged only the English-only issue and no other allegations would be $7,584. The cost for processing the 177 charges that involved multiple allegations including English-only would be $103,256.

3. **How many of those charges turned into cases in which the EEOC brought litigation? How many resources were spent during litigation of those cases? Were the cases settled? What type of relief was obtained in those cases?**

In FY 2007, the EEOC filed two lawsuits involving English-only policies. One was the Salvation Army case and the other case involved claims in addition to the English-only issue. Most of the lawsuits EEOC files challenging the legality of rules prohibiting the use of languages other than English in the workplace also contain claims of other forms of national origin discrimination, including harassment and discriminatory terms and conditions of employment. The two suits filed in FY 2007 represented 0.6 percent of all lawsuits filed in FY 2007. We note that suits filed in any given fiscal year may be based on charges filed in either the same or prior fiscal years. The two suits filed in FY 2007 were based on charges filed in prior fiscal years.

The cost of litigation of English-only workplace rules is difficult to quantify. As noted, most such lawsuits contain claims of other forms of national origin discrimination or other issues. Generally, we do not break down the costs of litigation on an issue-by-issue basis. In FY 2007, we estimate that the EEOC expended a total of approximately $20,977 on the two lawsuits filed in FY 2007. This amount reflects an estimate of staffing costs and direct costs of litigation, including costs related to all issues in the case.

In four cases containing English-only claims resolved in FY 2007, the EEOC recovered $746, 779, all through consent decrees that also provided substantial injunctive relief for victims of discrimination. Three of these cases involved claims in addition to the English-only issue. The two lawsuits filed in FY 2007 are still pending in litigation.

Transition from Outsourced Call Center

1. **What is the current status of EEOC's transition of the outsourced Call Center? What are the remaining steps that need to be taken for the transition to be complete?**

The transition has been divided into three phases. During the first phase, immediately following the closure of the contracted center, calls to the EEOC were directed to the Interactive Voice Recordings (IVR) and then distributed to all 53 EEOC offices. Contract staff was provided to offices that required assistance to handle the call volume.

Phase two is currently underway. Calls to the EEOC are currently directed to the IVR and then to 15 EEOC locations. EEOC has hired and trained 61 Information Intake Representatives (IIRs) to answer calls and assist the public. The IIRs utilize customer relations management software to access the knowledge base of EEOC information as well as record details of the call.

We are currently preparing for phase three of the transition, which we expect to be fully implemented by February 2009. Phase three will build on the current system and will include the technology support necessary to allow for calls to be automatically routed to IIRs based a geographic preference, with rollover to the next most available employee. The technology will also provide for call queuing, hold music, more detailed performance reporting and quality assurance monitoring. EEOC has begun the procurement process and expects to award the contract this fiscal year. The contract will be for 64 months, a initial period of 16 months and four one-year options.

2. **Are the new hires, the Intake Information Representatives (IIRs) and their supervisors, fully in place? What training have they been provided? Have all reasonable accommodations been provided to the IIRs with disabilities?**

We have hired 61 Information Intake Representatives (IIRs) and the 3 management positions within our Information Intake Group (IIG). The IIRs have been provided with two weeks of substantive training in the laws that the EEOC enforces, our processes, soft-skills and the technology used to manage the knowledge base and customer records.

During the hiring process, we asked all new hires if they would require any accommodations to perform their work. Once we gathered the requests we transmitted that information to the Computer/Electronic Accommodations Program (CAP) at the Department of Defense prior to their coming aboard. We continued to check with employees for additional needs once they started work and began training.

Because there was going to be a gap between the arrival of the employees and the receipt of technology from CAP, we worked with state vocational rehabilitation agencies to borrow technology and equipment until the CAP supplied accommodations arrived. Some of the new hires were also able to bring in personal copies of software and these were utilized in the interim.

All of the accommodations ordered by CAP in March have arrived and are being utilized by employees. There have been some follow-up requests and we will continue to monitor the need for accommodations.

Our Office of Information Technology has also been testing the interaction between the accommodation software and our own systems technology. Where we have found deficiencies we have requested priority resolution. In the meantime we have created several databases of information that are easily searchable by employees using assistive technology.

3. How is the call-answering function currently working at EEOC?

Callers to the EEOC's toll-free number are routed to the Interactive Voice Recording system where they can access information about the laws we enforce and our process 24-hours a day. Once callers opt to speak with an employee, the call is directed, based on area code, to one of the 15 EEOC locations that house the Information Intake Representatives (IIRs). The IIR that answers the phone uses a searchable knowledge database to provide information to the caller, and records information about the call into the customer relations software. If the EEOC has jurisdiction over the caller's situation, they will be directed to the website to fill out a questionnaire or one will be mailed to the caller. Should the caller be close to the time limits for filing a charge of discrimination, they will be transferred directly to an office for immediate handling.

4. Is all required technology in place and functioning properly?

All of the required technology for the second phase of the transition is in place and functioning properly. As noted above, we have started the process to acquire full technological support for our call answering function. We expect to award that contract before the end of the current fiscal year and transition to a fully implemented internal solution early next year.

5. What is the plan for evaluating the performance of EEOC's call answering function now and into the future?

The performance of the Information Intake Group (IIG) will be evaluated at several different levels. At the employee level we will be implementing a Quality Assurance Program that will include live and recorded monitoring of calls. This monitoring will ensure that the correct information and procedures are being utilized and will allow supervisors to coach employees to improve performance. At a programmatic level, the IIG management team, comprised of District Directors and IIG management staff, has started the process of developing performance goals and measures to ensure that we are providing good customer service. From an overall customer service perspective, the EEOC is once again working with the U.S. Department of Treasury, who contracts with an outside firm, the Claes Fornell International Group, to conduct a customer satisfaction survey utilizing the American Customer Satisfaction Index (ACSI).

AAPI Work Group

Thank you for establishing the Asian American and Pacific Islander Work Group last October and for your commitment to issues affecting Asian American and Pacific Islander workers in the Federal government.

1. **What is the progress of the Work Group?**

The workgroup has focused on three areas: 1) participation rates for AAPIs in the federal sector; 2) special emphasis programs; and 3) the lack of EEO complaints by the Asian community. As an initial step, the workgroup sent out a survey to Federal agencies to gather data regarding the anecdotal information we received from the AAPI community. The preliminary results confirm the anecdotal information that was heard from the AAPI community regarding the lack of resources and support for AAPI events and activities. Further, agencies are not recognizing participation rate problems pertaining to the AAPI community. In addition, even if an agency identifies low participation rates for AAPIs, it is not clear that the agency knows how to address the problem.

In addition to the survey, the workgroup has divided into subgroups to delve deeper into the focus areas. The subgroups have met with various organizations, agency representatives, and federal employees to develop best practices and to come up with recommendations. The subgroup dealing with participation rates of AAPIs in the federal sector looked at reports Federal agencies provide the Commission to identify trends and the status of AAPIs in the Federal Sector workforce. Based on all the information collected, the group is in the process of drafting a report outlining the findings and recommendations for agencies, management, AAPI groups, and federal employees. This report will be made available at the Commission hearing the week of July 21, 2008.

2. **Has the work group made any preliminary findings or recommendations?**

As noted above, the work group is currently drafting its findings and recommendations. However, there are a number of concerns that the workgroup is focusing on, such as glass ceilings and other barriers that impede AAPI progress. In particular, the workgroup is looking at best practices and models for agencies to adopt.

3. **Is the Chair still planning to have a Commission meeting on the subject in the spring as has been previously discussed?**

We are in the process of setting a date the week of July 21, 2008 for a Commission meeting on the issues. The meeting will provide a snapshot of the current AAPI situation in the federal sector from demographics to personal stories. It will also include a summary of the workgroup's findings and recommendations.

Field Restructuring

EEOC conducted a nationwide field restructuring that took effect on January 1, 2006. Pursuant to the restructuring, the Agency expanded the jurisdictional areas of district offices, reducing the number of district offices from 23 to 15. One of EEOC's stated goals of field restructuring was to decrease resources spent on management positions and allocate more resources to front-line staff conducting investigations, mediations and litigation, and providing outreach educational services to the community, thus delivering a more streamlined and efficient structure with better, faster service and more public access.

1. **Please provide details as to how the reallocation of resources has occurred, specifying among other things which management positions have been eliminated as a result of the field restructuring and which front-line positions have been funded and filled; AND 2. What has been the cost savings attributable to the restructuring? What efficiencies have been created as a result of field restructuring?**

The table labeled Attachment II is documentation of the planned fiscal costs and benefits of EEOC's field repositioning plan. The repositioning plan was implemented in 2006, and in the same year the Commission offered an early out/buy out package. Because those two actions operated over the same period, we were not able to calculate savings from one, as opposed to savings attributed to the other. Instead, funds made available from any savings were used to authorize the hiring of additional front-line positions. Seven SES Manger positions were eliminated immediately and sixteen total management (District Director and Regional Attorney) positions were to be eliminated. Thirteen of those 16 positions have been vacated. Of the 51 administrative positions in field offices identified to be vacated or moved to front-line positions, 39 positions have been vacated or moved to other necessary positions. As a result, following the implementation of the repositioning plan and the early out/buy out package, 70 investigator positions were authorized and have been filled.

3. **What efforts have been made to evaluate the impact of EEOC's field restructuring? Provide all information about the Agency's evaluation of the impact of field restructuring on staffing, workload, and delivery of core services to the public, and the results of that evaluation.**

The U.S. EEOC has actively participated in an eleven-month performance audit conducted by the United States Government Accountability Office(GAO-08-589), commissioned by Senator Barbara Mikulski (D-MD) in July 2007. At its inception, the evaluation was presented to EEOC management as a review of the Agency's January 1, 2006 nationwide field restructuring. Stated goals of the project were to review and evaluate the impact of EEOC's field restructuring, including assessment of the impact of field restructuring on staffing, workload, and delivery of core services to the public.

Due to the extent and scope of the stated study, EEOC has held in abeyance an internal evaluation of the field restructuring.

ATTACHMENT II

ATTACHMENT II

		CY Year	Cost Type	2006	2007	2008	2009	2010	2011	2012	2013	Total
I	Current Compensation Costs		Recurring	$7,628,924	$6,851,140	$6,693,222	$6,605,738	$6,335,723	$5,917,532	$5,436,829	$5,130,569	$50,599,677
II	Additional Implementation Cost											
	New Management Positions {5 FO Directors & 1 PA}		Recurring	$78,074	$156,147	$156,147	$156,147	$156,147	$156,147	$156,147	$156,147	$1,171,103
	New Admin Positions {15 Office Managers & 9 Admin Techs}		Recurring		$300,408	$600,816	$600,816	$600,816	$600,816	$600,816	$600,816	$3,905,304
	Two New SES Positions {OGC}		Recurring		$24,476	$48,951	$48,951	$48,951	$48,951	$48,951	$48,951	$318,182
	PCS		One-time	$300,000	$300,000	$0	$0	$0	$0	$0	$0	$600,000
	New Office ~ Las Vegas	$55,0	Recurring		$55,000	$55,000	$55,000	$55,000	$55,000	$55,000	$55,000	$385,000
		$125,000	One-time	$125,000								$125,000
	New Office ~ Mobile	$55,0(	Recurring		$55,000	$55,000	$55,000	$55,000	$55,000	$55,000	$55,000	$385,000
		$125,000	One-time	$125,000								$125,000
	Subtotal (Items I & II)			$8,256,998	$7,742,171	$7,609,136	$7,521,652	$7,251,637	$6,833,446	$6,352,743	$6,046,483	$57,614,265
										Additional Costs		$7,014,588
III	Recovery from Retirement											
	Management Positions			$420,212	$157,918	$0	$176,358	$153,975	$189,861	$67,904	$300,491	$1,466,719
	Admin Positions			$357,572	$0	$87,484	$93,657	$264,216	$290,842	$238,356	$210,464	$1,542,591
	Recovery Annual Total {adjusts next year current compensation}			$777,784	$157,918	$87,484	$270,015	$418,191	$480,703	$306,260	$510,955	$3,009,310
	50% credited current year {adjusts current year costs}			$388,892	$78,959	$43,742	$135,008	$209,096	$240,352	$153,130	$255,478	$1,504,655
	Current Year Adjusted Cost			$7,868,106	$7,663,212	$7,565,394	$7,386,645	$7,042,542	$6,593,095	$6,199,613	$5,791,006	$56,109,610
	Difference with Year One Current Compensation Costs {Item I}			($239,182)	($34,288)	$63,530	$242,280	$586,383	$1,035,830	$1,429,311	$1,837,919	$4,921,782

Headquarters Restructuring

1. **What is the status of the Headquarters Restructuring effort and when will a final plan for Headquarters Restructuring be presented?**

A Workgroup consisting of both headquarters and field staff was assembled in Spring 2007 to consider headquarters restructuring. That group met several times throughout the year and issued a report to the Chair in December 2007. The Workgroup made several recommendations. The Chair has shared the report with the other Commissioners and with all of EEOC's senior executives.

Since our field repositioning in 2006, there has been additional attrition in headquarters which renders the likelihood of shifting resources to the field less realistic. Therefore, the Workgroup looked at changes that would make our headquarters operations: more efficient; eliminate redundancies; and provide the best program support to our field offices. The majority of the Workgroup's recommendations did not reflect a substantial consensus on the Workgroup. The issue of whether the Workgroup would benefit from the assistance of an outside expert, and the resultant expenditure of funds, was not resolved by the Commission during the Workgroup's tenure. And lastly, any significant reorganization proposal will require approval, by vote, of the Commission. While some aspects of the Workgroup's recommendations may be proposed for action in the coming months, these factors make it unlikely that any major reorganization of EEOC's headquarters will occur during the balance of 2008.

REP. RODNEY P. FRELINGHUYSEN
QUESTIONS FOR THE RECORD
U.S. EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

Backlog in Private Sector Discrimination Charges

1. **Even with the additional staff requested in FY09, you are not projecting any decrease in the backlog for the foreseeable future. Please submit for the record a chart showing the projected inventory of private sector discrimination charges through FY 2012, if you assume the continuation of staffing levels reflected in the FY09 budget request.**

We have provided as **Attachment I** a revised version of the Workload Table included in our FY 2009 budget request to reflect a projection through FY 2012 and assuming the continuation of staffing level reflected in the FY 09 budget request. The FY 2012 projected year-end inventory is 97,009 charges.

2. **What additional resources would be required to reduce the inventory to 28,000 by 2012?**

The 2009 President's Budget provides resources for 2,556 full-time equivalent employees – 175 more FTE than the Commission will have in 2008. Of these additional staff, 109 are personnel to address the Commission's private-sector charge workload. We believe the 2009 Budget provides sufficient support for our effort to reduce the inventory and our average charge processing time, while balancing many other competing priorities Government-wide and reflecting the President's commitment to eliminating the budget deficit by 2012.

Using the original Workload Table from our FY 2009 budget request and projecting its assumption of 100% backfill of all attrited positions, we have calculated the number of additional staff that would have to be hired each year and have determined that beyond the FY 09 request of 75 new investigators and 6 new mediators, we would need 126 new investigators and 6 new mediators in the years FY 2010, FY 2011 and FY 2012. If the agency had the level of staffing resources in those years, the pending inventory at the end of FY 2012 would be 27,932, slightly below the 28,000 suggested in the question.

3. **A measure of how you are doing on your private sector workload is the percentage of charges resolved in 180 days or less. What was that percentage for each of the last four fiscal years, and what percentage are you projecting for each year through FY 2012?**

The percentage of the agency's charges closed in 180 days or less in the past four fiscal years is shown on the chart below:

Fiscal Year	Percent of Charges Closed in 180 Days or Less
2007	55.7%
2006	60.7%
2005	65.9%
2004	67.1%

The agency's current projections, as reflected in EEOC's FY 2009 Budget Request, charts the following goals:

Fiscal Year	Percent of Charges Closed in 180 Days or Less
2008	72%
2009	73%
2010	73%
2011	74%
2012	75%

4. **In addition to EEOC enforcement resolutions, charges are also resolved through mediation, and by State and Local Fair Employment Practices Agencies. Please provide the FY07 actual budgets for these three activities, and the corresponding number of resolutions produced by each activity.**

See table below. Our overall administrative enforcement figures of 72,442 resolutions reflect all of our charge activity completed both through our enforcement activity (63,793 resolutions) and our mediation activity (8,649 resolutions).

The National Mediation Program was staffed by 18 ADR Coordinators and 72 mediators and was supplemented by $1.8 million dollars that was used to obtain the services of contract mediators.

The FEPAs resolved a total of 48,717 charges under contract with EEOC in FY 2007, which are not included in the EEOC's year-end resolution figures. The total budget for State and Local Program activities was $30 million in FY 2007; however, this amount also included funding for the TEROs and other program expenses in support of the FEPAs.

Private Sector Enforcement

	FY 2007 Actual	Resolutions
Administrative Charge Processing	$161,259,000	63,793
Mediation	22,120,000	8,649
State and Local	29,996,000	48,717
Total	$213,375,000	121,159

State and Local Fair Employment Practices Agencies

5. **A portion of your appropriation is set aside to reimburse State and Local Fair Employment Practices Agencies (FEPAs) for the private sector charges that they resolve on your behalf. You are proposing to reduce that amount by more than $3 million. What is the rationale for this reduction?**

The reduction is due to a decrease of charges received by FEPAs, as well as a desire to focus more resources on the private-sector charge backlog. FY 2002 charge receipts totaled 63,376 while FY 2007 charge receipts were 52,854. This is a 17% reduction over 5 years. During that same period, EEOC's case inventory has significantly increased. The rationale for the reduction is the difference in the workload trends between EEOC and the FEPAs. This year, during EEOC's annual planning conference with our FEPA counterparts, EEOC's Chief Operating Officer presented information to the group and explained that, because the FEPAs had produced fewer charges than originally projected the past few years, the 2009 President's Budget for EEOC included a reduction for State and Local Program activities.

6. **Public Law 110-161 provided not to exceed $29,140,000 for this activity. You have proposed spending only $28,000,000. Why? And how many additional private sector charges could be resolved by FEPAs with the additional $1,140,000?**

The FEPAs' receipts and caseload have been declining over the past five years. The following table demonstrates the inability of some FEPAs to spend funds previously budgeted for case processing. These funds were used for FEPA training, data clean-up, outreach, and other FEPA purposes because of year-end requirements to obligate the funds to the program.

Fiscal Year	**S&L funds not spent on case processing**
2004	**$1 million**
2005	**$2.5 million**
2006	**$1 million**
2007	**$1 million**
Total	**$5.5 million**

If the FEPAs are able to handle the additional workload at $550 per charge resolution, they could resolve an additional 2,073 private sector charges. However, as the chart depicts, the FEPAs were not able to absorb the full $29,996,000 which was budgeted primarily for case processing in FY 2007.

In order to resolve additional charges we would have to consider the transfer to the FEPAs for processing some charges filed with the Commission. If we did, the additional $1,140,000, at the current per charge rate of $550, would fund almost 2,100 more charge resolutions for the FEPAs, assuming that they have the ability to handle additional capacity.

Automated Document Management System

7. **Your budget document mentions a cost-benefit analysis showing that the EEOC could achieve internal "efficiency savings" of $15 million if you implemented a Document Management System agency-wide. How much would it cost to implement that? Are you requesting funds for this in FY09?**

EEOC had an external consultant complete a cost benefit analysis comparing current paper-based processing against implementation of a Document Management System (DMS). This analysis indicated that EEOC could achieve approximately $15M annually in process-efficiency savings through the implementation of a nation-wide DMS. In addition to efficiency savings, a DMS provides offsite electronic backup of mission critical documents for disaster recovery.

The study estimated that full implementation of a DMS would cost approximately $11-12M over two-three years, with a $2-3M recurring cost. Due to this high estimated cost, EEOC is reassessing requirements in order to develop a lower-cost and more targeted implementation approach. EEOC has already made some investment in DMS technology, including conversion of all federal appellate case files into a structured electronic format and implementing a case management repository for litigation purposes. However, a major effort would be involved to migrate investigative charge files and other business-related documents into the DMS.

EEOC is currently developing new business cases and revised cost estimates to support future funding requests for this initiative. The new business cases and related estimates will be completed by December 31, 2008.

Termination of National Contact Center

8. **The National Contact Center ceased operations in December. You are in the process of bringing the function in-house and dispersing it among 15 offices across the country. Last year you submitted for the record that bringing the function in-house would involve one-time costs of $2.3 million, and additional annual costs of $3.2 million. What are the current estimates?**

The one time migration cost for the in-house function is $2.2 million, $100,000 less than estimated. The annual cost is estimated at $3.6 million, an increase of $400,435 over the estimate.

HQ Relocation and Field Space Reconfiguration

9. **You are preparing to move into a new headquarters building later this year. What is the total cost of that move and how much of that cost have you already paid?**

The total cost of the move is $24,629,960. GSA and EEOC have available $23,629,960. Funds were obligated with GSA through Reimbursable Work Authorizations. We have not been billed by GSA; therefore, no payments have been made to GSA.

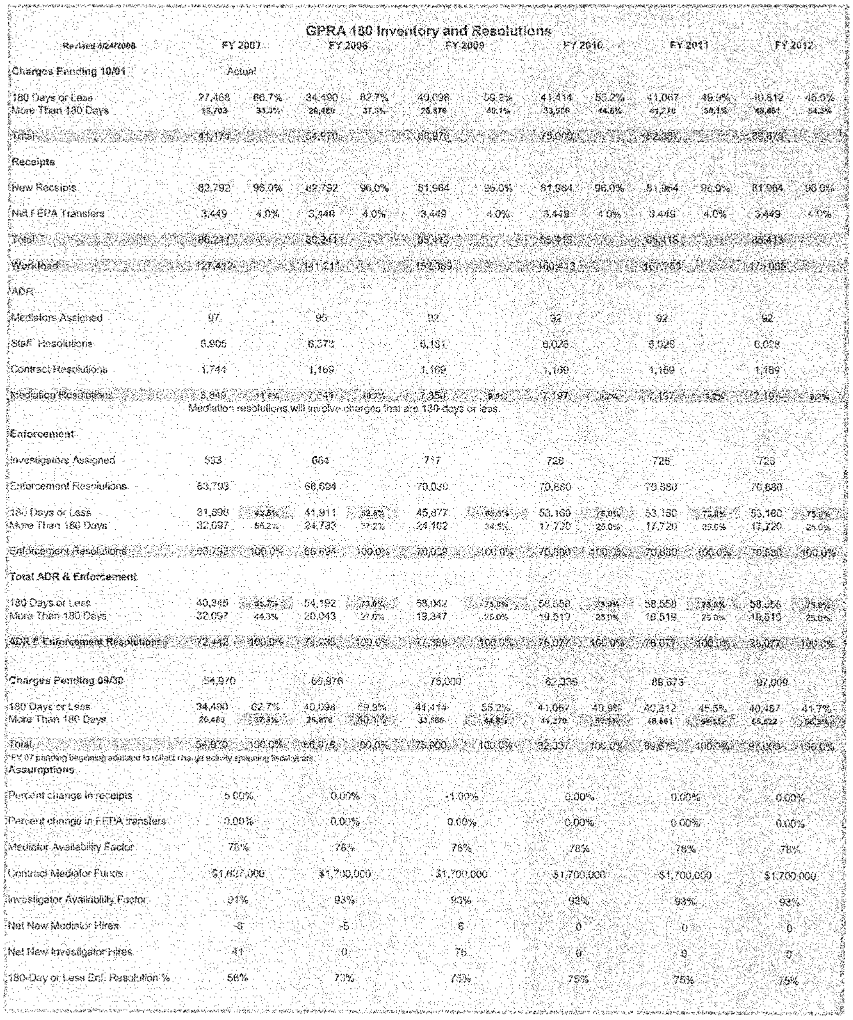
10. **What is the total amount in your FY09 request for headquarters relocation, and is that an increase or decrease from the amount in your budget this year?**

$1,000,000 is in the FY 09 budget base for the headquarters' relocation. This represents a decrease from the amount in our budget for this fiscal year. To fund the headquarters relocation in FY 2007 and FY 2008, we deferred hiring additional staff as well as delayed required field office relocations.

11. **What is the annual rent cost at your new headquarters compared to those at your current headquarters location?**

The new headquarters' annual rent will be $7,400,000 under a 10-year lease through 2018. Annual rent under our current lease, which expires in July 2008, is $7,700,000. Amortizing the full cost of current construction and build out over the 10-year lease, future rents would be higher than current rents. Had we been able to remain at our current location, we fully expected future rent to rise from the $48 per square foot we are now paying to the mid-$60s the owner is trying to obtain.

ATTACHMENT I



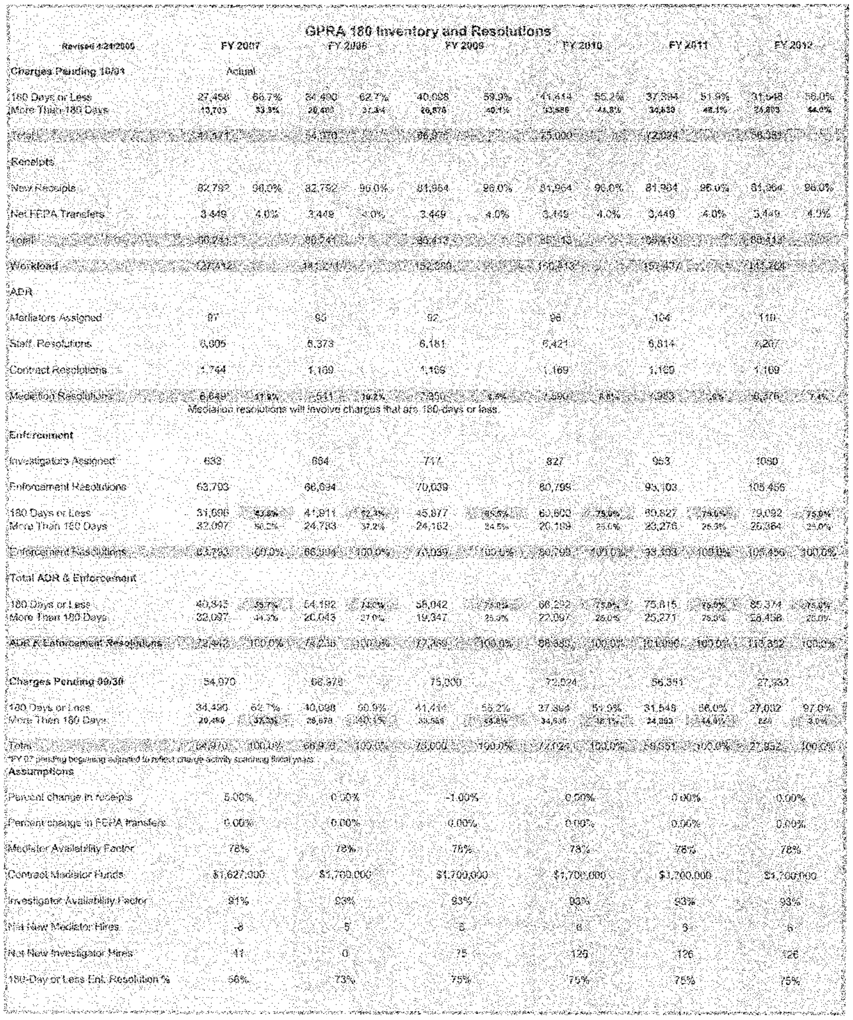
GPRA 180 Inventory and Resolutions

Revised 4/24/2008	FY 2007		FY 2008		FY 2009		FY 2010		FY 2011		FY 2012	
Charges Pending 10/01	Actual											
180 Days or Less	27,468	66.7%	34,490	62.7%	40,096	59.9%	41,414	55.2%	41,067	49.9%	40,812	45.5%
More Than 180 Days	13,703	33.3%	20,480	37.3%	26,880	40.1%	33,586	44.8%	41,270	50.1%	48,861	54.5%
Total	41,171		54,970		66,976		75,000		82,337		89,673	
Receipts												
New Receipts	82,792	96.0%	82,792	96.0%	81,964	96.0%	81,964	96.0%	81,964	96.0%	81,964	96.0%
Net FEPA Transfers	3,449	4.0%	3,449	4.0%	3,449	4.0%	3,449	4.0%	3,449	4.0%	3,449	4.0%
Total	86,241		86,241		85,413		85,413		85,413		85,413	
Workload	127,412		141,211		152,389		160,413		167,750		175,086	
ADR												
Mediators Assigned	97		95		92		92		92		92	
Staff Resolutions	6,905		6,372		6,191		6,028		6,028		6,028	
Contract Resolutions	1,744		1,169		1,169		1,169		1,169		1,169	
Mediation Resolutions	8,649	11.9%	7,541	10.2%	7,360	9.5%	7,197	9.5%	7,197	9.5%	7,197	9.5%
	Mediation resolutions will involve charges that are 180 days or less.											
Enforcement												
Investigators Assigned	533		664		717		728		728		728	
Enforcement Resolutions	63,793		66,694		70,030		70,880		70,880		70,880	
180 Days or Less	31,696	49.7%	41,911	62.8%	45,877	65.5%	53,160	75.0%	53,160	75.0%	53,160	75.0%
More Than 180 Days	32,097	50.3%	24,783	37.2%	24,152	34.5%	17,720	25.0%	17,720	25.0%	17,720	25.0%
Enforcement Resolutions	63,793	100.0%	66,694	100.0%	70,029	100.0%	70,880	100.0%	70,880	100.0%	70,880	100.0%
Total ADR & Enforcement												
180 Days or Less	40,345	55.7%	54,192	73.0%	58,042	75.0%	56,558	74.3%	56,558	74.3%	56,558	74.3%
More Than 180 Days	32,097	44.3%	20,043	27.0%	19,347	25.0%	19,519	25.7%	19,519	25.7%	19,519	25.7%
ADR & Enforcement Resolutions	72,442	100.0%	74,235	100.0%	77,389	100.0%	76,077	100.0%	76,077	100.0%	76,077	100.0%
Charges Pending 09/30	54,970		66,976		75,000		82,336		89,673		97,009	
180 Days or Less	34,490	62.7%	40,096	59.9%	41,414	55.2%	41,067	49.9%	40,812	45.5%	40,487	41.7%
More Than 180 Days	20,480	37.3%	26,880	40.1%	33,586	44.8%	41,270	50.1%	48,861	54.5%	56,522	58.3%
Total	54,970	100.0%	66,976	100.0%	75,000	100.0%	82,337	100.0%	89,673	100.0%	97,009	100.0%

*FY 07 pending beginning adjusted to reflect charge activity spanning fiscal years.

Assumptions	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Percent change in receipts	5.00%	0.00%	-1.00%	0.00%	0.00%	0.00%
Percent change in FEPA transfers	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Mediator Availability Factor	75%	78%	78%	78%	78%	78%
Contract Mediator Funds	$1,657,000	$1,700,000	$1,700,000	$1,700,000	$1,700,000	$1,700,000
Investigator Availability Factor	91%	93%	93%	93%	93%	93%
Net New Mediator Hires	-6	-5	6	0	0	0
Net New Investigator Hires	41	0	75	0	0	0
180-Day or Less Enf. Resolution %	56%	73%	75%	75%	75%	75%

ATTACHMENT II



GPRA 180 Inventory and Resolutions

Revised 4/24/2008	FY 2007		FY 2008		FY 2009		FY 2010		FY 2011		FY 2012	
Charges Pending 10/01	Actual											
180 Days or Less	27,458	66.7%	34,490	62.7%	40,098	59.9%	41,414	55.2%	37,394	51.9%	31,548	56.0%
More Than 180 Days	13,703	33.3%	20,480	37.3%	26,876	40.1%	33,586	44.8%	34,630	48.1%	24,803	44.0%
Total	41,171		54,970		66,975		75,000		72,024		56,351	
Receipts												
New Receipts	82,792	96.0%	82,792	96.0%	81,964	96.0%	81,964	96.0%	81,964	96.0%	81,964	96.0%
Net FEPA Transfers	3,449	4.0%	3,449	4.0%	3,449	4.0%	3,449	4.0%	3,449	4.0%	3,449	4.0%
Total	86,241		86,241		85,413		85,413		85,413		85,413	
Workload	127,412		141,211		152,388		160,413		157,437		141,764	
ADR												
Mediators Assigned	97		95		92		98		104		110	
Staff Resolutions	6,905		6,373		6,181		6,421		6,814		7,207	
Contract Resolutions	1,744		1,169		1,169		1,169		1,169		1,169	
Mediation Resolutions	8,649	11.9%	7,542	10.2%	7,350	9.5%	7,590	8.6%	7,983	7.9%	8,376	7.4%

Mediation resolutions will involve charges that are 180-days or less.

	FY 2007		FY 2008		FY 2009		FY 2010		FY 2011		FY 2012	
Enforcement												
Investigators Assigned	632		684		717		827		953		1080	
Enforcement Resolutions	63,793		66,694		70,039		80,799		93,103		105,456	
180 Days or Less	31,696	49.8%	41,911	62.8%	45,877	65.5%	60,600	75.0%	69,827	75.0%	79,092	75.0%
More Than 180 Days	32,097	50.2%	24,783	37.2%	24,162	34.5%	20,199	25.0%	23,276	25.0%	26,364	25.0%
Enforcement Resolutions	63,793	100.0%	66,694	100.0%	70,039	100.0%	80,799	100.0%	93,103	100.0%	105,456	100.0%
Total ADR & Enforcement												
180 Days or Less	40,345	55.7%	54,192	73.0%	58,042	75.0%	66,292	75.0%	75,815	75.0%	85,374	75.0%
More Than 180 Days	32,097	44.3%	20,043	27.0%	19,347	25.0%	22,097	25.0%	25,271	25.0%	28,458	25.0%
ADR & Enforcement Resolutions	72,442	100.0%	74,236	100.0%	77,389	100.0%	88,389	100.0%	101,086	100.0%	113,832	100.0%
Charges Pending 09/30	54,970		66,978		75,000		72,024		56,351		27,852	
180 Days or Less	34,490	62.7%	40,098	59.9%	41,414	55.2%	37,394	51.9%	31,548	56.0%	27,032	97.0%
More Than 180 Days	20,480	37.3%	26,878	40.1%	33,586	44.8%	34,630	48.1%	24,803	44.0%	820	3.0%
Total	54,970	100.0%	66,978	100.0%	75,000	100.0%	72,024	100.0%	56,351	100.0%	27,852	100.0%

*FY 07 pending beginning adjusted to reflect charge activity spanning fiscal years.

Assumptions	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Percent change in receipts	5.00%	0.00%	-1.00%	0.00%	0.00%	0.00%
Percent change in FEPA transfers	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Mediator Availability Factor	78%	78%	78%	78%	78%	78%
Contract Mediator Funds	$1,627,000	$1,700,000	$1,700,000	$1,700,000	$1,700,000	$1,700,000
Investigator Availability Factor	91%	93%	93%	93%	93%	93%
Net New Mediator Hires	-8	5	5	6	6	6
Net New Investigator Hires	41	0	75	126	126	126
180-Day or Less Enf. Resolution %	56%	73%	75%	75%	75%	75%

ROBERT B. ADERHOLT
QUESTIONS FOR THE RECORD
U.S. EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

Good afternoon & thank you for joining us today. I was surprised that there was no mention in your written testimony of the singular issue that almost derailed this subcommittee's bill for FY2008. As you know, the English-only issue is not new and it is not one that is going away. What can you tell us about the litigation against the Salvation Army which sparked this debate last year, and does the EEOC have any other cases ongoing that were also initiated because of English-only policies?

If you do not think that one year is enough time for the Salvation Army to give its employees to learn English, is there any timeframe that would be acceptable? Or is it the Commission's policy that there should be no requirement at all?

The EEOC has six cases now pending in litigation that involve English-only policies, including the Salvation Army case. Over the past three years, such cases have represented less than one percent of the total suits filed by the EEOC, or 0.7% of total suits filed over this period. Most of the lawsuits EEOC files challenging the legality of rules prohibiting the use of languages other than English in the workplace also contain claims of other forms of national origin discrimination, including harassment and discriminatory terms and conditions of employment.

The Commission's policy on this issue is set forth in Section 13 of its Compliance Manual, "National Origin Discrimination," and in its Guidelines on Discrimination Because of National Origin, 29 C.F.R. § 1606.7. With respect to the applicability of Title VII to English-only policies, the Compliance Manual states that:

> Title VII permits employers to adopt English-only rules under certain circumstances. As with any other workplace policy, an English-only rule must be adopted for nondiscriminatory reasons. An English-only rule would be unlawful if it were adopted with the intent to discriminate on the basis of national origin. Likewise, a policy that prohibits some but not all of the foreign languages spoken in a workplace, such as a no-Navajo rule, would be unlawful. Even where an English-only rule has been adopted for nondiscriminatory reasons, the employer's use of the rule should relate to specific circumstances in its workplace. An English-only rule is justified by "business necessity" if it is needed for an employer to operate safely or efficiently.

Some employers have rules that require employees to speak only English at all times during the workday, including work breaks when talking to co-workers whose primary language is not English. Because language characteristics are closely associated with national origin, the Commission takes the view that a total prohibition on people speaking their primary language can create an atmosphere of intimidation and inferiority and disadvantage employment opportunities based on national origin.

Employers can require employees to speak English when they have a legitimate business reason for the requirement. For example, the Commission recognizes that it may be necessary to require employees to speak English to:

- communicate with customers, coworkers, or supervisors who only speak English
- promote safety, especially in emergencies or other situations in which workers must speak a common language
- promote efficiency in cooperative work assignments
- enable a supervisor who only speaks English to monitor the performance of an employee whose job duties require communication with coworkers or customers.

EEOC Compliance Manual, Section 13, § IV. C. 1. We note that the EEOC's Guidelines "do not promote or require bilingualism in the workplace. The goal of the Guidelines is to protect employees from discriminatory employment practices and to remove unnecessary barriers, such as the broad speak-English-only rules, which result in the denial of employment opportunities to individuals on the basis of their national origin." 45 Fed. Reg. 85,632, 85,632 (Dec. 29, 1980).

The EEOC filed suit against The Salvation Army on March 30, 2007, alleging that The Salvation Army imposes an English proficiency requirement for jobs where there is no legitimate business need to speak English. Specifically, in its complaint the EEOC alleges that The Salvation Army subjected two foreign-born workers to national origin discrimination by requiring them to comply with its English only rule and terminating them because they failed to comply with its proficiency requirement. The Salvation Army began to enforce its English language policy in late 2004 in the Framingham, MA store where these two women were employed; the women had worked at the store successfully since 1999. The women worked as clothes sorters in the back-of-the-store area with no customer contact. Their primary language was Spanish and they were not fluent in speaking or understanding English. Both women worked commendably for at least five years using Spanish as their primary mode of communication. On or about December 21, 2005, both women were fired after being given approximately one year to learn to speak English and told to come into compliance with the policy yet continued to speak Spanish to each other while at work.

The Salvation Army contends that it did not engage in national origin discrimination and that the English requirement was necessary to permit the workers to assist customers and to operate the cash register. After investigating the facts, the EEOC concluded that the workers were employed as clothes sorters, had no legitimate need to speak English to perform their job duties, had successfully performed their jobs, including assisting customers, for many years, and, like some English-speaking employees, never had to operate the cash register. The Salvation Army did not put forth evidence in the investigation to support its assertion that it had a legitimate business justification to require the workers to learn to speak English within a year. Accordingly, after attempting to resolve the case in the conciliation process, the EEOC filed suit. The workers' failure to learn English has no bearing on the legal issue presented in this case, i.e., whether there was a legitimate business need for English proficiency in their jobs. It remains to be seen whether the defendant can establish a business necessity defense. The case is currently in active litigation.

WEDNESDAY, APRIL 2, 2008.

LEGAL SERVICES CORPORATION

WITNESSES

HELAINE M. BARNETT, PRESIDENT, LEGAL SERVICES CORPORATION
FRANK B. STRICKLAND, CHAIRMAN, LEGAL SERVICES CORPORATION

OPENING STATEMENT BY MR. MOLLOHAN

Mr. MOLLOHAN. The hearing will come to order. Well, good afternoon. We welcome two witnesses to testify on the fiscal year 2009 budget request for the Legal Services Corporation, Ms. Helaine Barnett and Mr. Frank Strickland, respectively, the LSC's President and Board Chairman.

Established in 1974, the Legal Services Corporation's mission is to promote equal access to justice in our nation and to provide high quality, civil legal assistance to low income people.

The Legal Service Corporation carries out this mission by awarding grants to legal service providers in more than 900 locations across the nation. The Legal Services Corporation budget request for the fiscal year 2009 is $471,400,000 an increase of $121 million over the current year funding level.

In 2005 the LSC issued a Justice Gap report which was a nationwide study which found that half of the eligible people who seek legal help from LSC funded programs are turned away due to lack of resources. Clearly, there is much work to be done to improve America's access to justice.

Ms. Barnett and Mr. Strickland, we appreciate your efforts to grant people access to justice. We welcome your testimony. And before you proceed, I would like to call on my Ranking Member, Mr. Frelinghuysen.

OPENING STATEMENT OF MR. FRELINGHUYSEN

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman. I join the Chairman in welcoming you both to testify about your 2009 budget request. The Act that created the Legal Services Corporation in 1974 provided you with pass through budget authority and therefore you can provide the Appropriations Committee with an independent assessment of your funding without OMB approval.

We know those amounts. I think we are aware that the President's budget requested a lower amount, $311 million which is $39.5 million below the fiscal year 2008 level. Also, you have had two recent GAO reports that contain many recommendations on governance, oversight, and grants management. I will have some questions about the follow up work you are doing in that regard. And like the Chairman, I welcome you. Thank you for the good job you are doing.

Mr. MOLLOHAN. Thank you. Both your written statements will be made a part of the record and Chairman Strickland would you like to proceed?

OPENING STATEMENT

Mr. STRICKLAND. Yes. Thank you, Mr. Chairman. Chairman Mollohan and Congressman Frelinghuysen and members of the Subcommittee, thank you for giving me the opportunity to testify today on the work of the Legal Services Corporation. And on behalf of our Board of Directors, I want to thank you for the continued support that you have shown for this program. It means a great deal to the lives of our clients and fulfills our obligation as citizens to support equal access to justice.

We have a dedicated and committed team of directors, each of whom take their obligations very seriously. The Board fully supports our appropriations request for fiscal year 2009 and feels that it is based on a necessary assessment of where we need to be on the road to closing the justice gap in America.

The Legal Services Corporation is the largest single source of funding for civil legal aid for low income individuals and families. We fund 137 programs with more than 900 offices serving every congressional district. More than 95 percent of LSC appropriations are distributed to these programs. The Corporation provides guidance, training and oversight to ensure that programs provide high quality legal services and comply with congressional restrictions, LSC rules and regulations.

In that regard, I would like to address at the outset the issue of two GAO reports on LSC. As you know, GAO published reports in 2007 and early 2008 on our Corporation's governance and grants management. We appreciated both of these reviews and accepted all of the recommendations. With regard to the governance and accountability report, the Board has approved a code of ethics and conduct for directors, officers, and employees of the Corporation; established a separate audit committee of the Board; and approved a charter for that Committee, and approved the continued use of the Government Accounting Standards Board guidelines for LSC's financial reports.

LSC management has completed the first phase of a continuity of operations plan for the Corporation, which has been disseminated to all LSC staff. In addition, we have begun an intensive review of the elements of a risk management program so that we can adopt a best practices program commensurate with the size and budget of LSC.

With respect to the GAO report on LSC's grants management and oversight, the Board of Directors at its January 2008 meeting appointed an ad hoc committee consisting of three board members, one of whom I designated as board liaison. We assigned them to work directly with LSC management and its Office of Compliance and Enforcement, the Office of Program Performance, and the Office of Inspector General to implement the recommendations of the GAO reports.

The Board liaison held two day long meetings at which representatives of these offices identified each aspect of fiscal oversight, areas where improvement could be made, and areas where greater communication and organization would improve fiscal oversight and help achieve the LSC mission.

Importantly, management and the OIG identified in detail the oversight roles and responsibilities of each relevant organization within LSC, and in so doing specifically addressed oversight of the independent public accountant process.

The Ad Hoc Committee has briefed the Board and the Board is expected to act on the Ad Hoc Committee's recommendations regarding a delineation of roles and responsibilities during its meeting at the end of April. As you know, the report on grants management contained troubling references to alleged improper use of grant funds by nine LSC funded programs. Eight of the nine cases were referred to the then acting assistant inspector general on November 20, 2007 by President Barnett.

The compliance review of the ninth program, Nevada Legal Services, had begun prior to the GAO report and was retained for a follow up by the Office of Compliance and Enforcement. That report is near completion and further action will result. In addition, in an advisory to all LSC funded programs dated March 20, 2008, President Barnett reminded executive directors of the need for appropriate documentation of expenditures of LSC funds, of the regulations regarding unallowable costs, and specifically stressed the prohibition of expenditures for alcohol and lobbying, the need for written policies governing salary advances, and a reminder of the regulation governing derivative income.

The OIG has visited three grantees and is scheduled to visit the other five over the next two months. The OIG has reported to us that for the three sites already reviewed and based on the OIG's preliminary analysis, management at the grantees has taken corrective actions based on the GAO recommendations and has implemented or is implementing additional controls to prevent those issues from recurring.

And speaking of the OIG, I am pleased to announce the appointment of Jeffrey E. Schanz as the Corporation's Inspector General effective March 3, 2008. Mr. Schanz is in the audience today. Mr. Schanz comes to LSC from the U.S. Department of Justice where he served for the past 17 years as Director of the Office of Policy and Planning in the Audit Division at the Office of the Inspector General at the Justice Department.

Mr. Chairman, we are taking these matters very seriously and are giving our highest priority to implement all the recommendations with speed and diligence. All of this effort is in recognition of the fact that stewardship of taxpayer dollars is among our most important responsibilities.

Our Board remains proud of this program and the critical role it plays in our nation's justice system. And we will continue to ensure that LSC provides the most effective and efficient representation possible of the civil legal needs of the eligible poor throughout this country.

Thank you and I would be happy to answer questions at the appropriate time.

[Written testimony by Frank B. Strickland Chairman, Legal Services Corporation]

Submitted 3/27/08

Testimony of

Frank B. Strickland
Chairman, Legal Services Corporation

Before the
Subcommittee on Commerce, Justice, Science, and Related Agencies
Committee on Appropriations
House of Representatives

April 2, 2008

Chairman Mollohan, Congressman Frelinghuysen, and Members of the Subcommittee, thank you for giving me the opportunity to testify today on the work of the Legal Services Corporation (LSC). On behalf of our Board of Directors, I also want to thank you for the continued support that you have shown for this program. It means a great deal to the lives of our clients and fulfills our obligation as citizens to support equal access to justice. We have a dedicated and committed team of Directors each of whom take their obligations as directors very seriously.

The Legal Services Corporation is the single largest source of funding for civil legal aid for low-income individuals and families. We fund 137 programs with more than 900 offices serving every Congressional district. More than 95 percent of LSC appropriations is distributed to these programs. The Corporation provides guidance, training and oversight to ensure that programs provide high-quality legal services and comply with Congressional restrictions, LSC rules, and regulations.

GAO REPORTS

In that regard, I would like to address at the outset the issue of the two Government Accountability Office (GAO) reports on LSC. As you know, GAO published a report in 2007 on the Corporation's governance and accountability and in early 2008 on our grants management and oversight. We appreciated both of these reviews of our policies and practices and cooperated fully with GAO throughout the audits. Further, we accepted all of the recommendations and are pleased to report the following progress to the subcommittee this afternoon. With regard to the Governance and Accountability Report, the Board has:

- Approved a Code of Ethics and Conduct for directors, officers and employees of the Corporation.

- Established a separate Audit Committee of the Board and approved a charter for the Committee.

Submitted 3/27/08

- Approved the continued use of the Government Accounting Standards Board guidelines for LSC's financial reports.

LSC management has completed the first phase of a Continuity of Operations Plan for the Corporation, which has been disseminated to all LSC staff.

In addition, we have begun the process of establishing a more formal and rigorous risk management program at the Corporation. Management is now researching a variety of risk management programs and "best practices" so we can adopt a program commensurate with the size and budget of LSC.

The Board has had regular updates from management on compensation, personnel policy, compliance, and financial issues. In addition, the Board directed the Office of Inspector General to deliver the 2007 audit report from LSC's independent public accountant earlier than last year when it was delivered in April. The audit was delivered this year on January 7. Work on the remaining GAO recommendations and implementation are expected in 2008. These recommendations include:

- Orientation for new Board members to familiarize them with LSC's programmatic roles and governance and accountability issues.

- Establishing clear purposes, duties and responsibilities of all Board committees by adopting more comprehensive charters for each committee.

- Implementing a formal means by which the Board can evaluate its collective performance and the performance of individual members.

- Periodic evaluations of key management processes, including risk management and mitigation, internal controls and financial reporting.

With regards to the GAO report on LSC's grants management and oversight, as evidence of its commitment, the Board of Directors at its January 2008 meeting established a three-member *ad hoc* committee, including a Board liaison, to work directly with LSC management and its Office of Compliance and Enforcement (OCE), the Office of Program Performance (OPP), and the Office of Inspector General (OIG) to implement the recommendations of the GAO reports.

Soon thereafter, the Board liaison and committee members separately interviewed members of management and the OIG. The Board liaison then held two day-long meetings at which representatives of OCE, OPP, LSC management and the OIG identified each aspect of fiscal oversight, areas where improvement could be made, and areas where greater communication and organization would improve fiscal oversight in achieving LSC's mission.

Submitted 3/27/08

Working groups were formed to address various aspects of the fiscal oversight process and changes are being considered and implemented on an on-going basis. Importantly, management and the OIG identified in detail the oversight roles and responsibilities of each relevant organization within LSC, and in so doing specifically addressed oversight of the Independent Public Accountant process. The committee plans to draft a clear delineation of grantee oversight duties among the three offices charged with oversight responsibilities. The committee also conducted a public meeting on March 24, and has formally briefed the Board. The Board is expected to act on the *ad hoc* committee's recommendations on a clear delineation of roles and responsibilities at its meeting at the end of April.

In order to focus on all the issues raised by the GAO report in the manner and with the diligence required, all routine program visits during the second quarter of the fiscal year were suspended. During that time LSC has:

- Established working groups, held many hours of joint staff meetings, and is reviewing a draft memorandum of understanding for information sharing among OCE, OPP, and the OIG, while ensuring the OIG's independence.

- Established new protocols for information sharing and coordination of all work between OCE and OPP, including site visits; begun updating all procedures manuals to reflect those changes, which will be completed by the end of April; and completed by March 28 four in-depth training sessions.

- Reviewed and expanded the current risk factors for selection of grantees for program visits and is updating procedures, which will be included in the manuals to be completed by the end of April. In addition, LSC is drafting new procedures to ensure that they reflect our current practice of using information and results from oversight and audit activities and other risk criteria in planning internal control and compliance reviews, which will also be included in our manuals.

- Provided to grantees, either in draft version for comment or in final form, all reports on program visits through 2007.

The report on grants management contained troubling references to potentially improper use of grant funds by nine LSC-funded programs. Eight of the nine cases were referred to the Acting Inspector General on November 20, 2007, by President Barnett. The compliance review of the ninth program, Nevada Legal Services, Inc., had commenced prior to the GAO report and was retained for follow-up by the Office of Compliance and Enforcement. That report is near completion and we will inform you of what further action will result.

Submitted 3/27/08

In addition, President Barnett sent an Advisory to all LSC-funded programs on March 20, 2008, reminding Executive Directors of the need for appropriate documentation of expenditures of LSC funds, of the regulations regarding unallowable costs, and specifically stressed the prohibition of expenditures for alcohol and lobbying, the need for written policies governing salary advances, and a reminder of the regulation governing derivative income.

The OIG has visited three grantees of the eight identified in the GAO Report and is scheduled to visit the other five over the next two months. The OIG has reported that, "For the three sites reviewed and based on the OIG's preliminary analysis, management at the grantees have taken corrective actions based on the GAO recommendations, and have or are implementing additional controls to prevent those issues from recurring."

Speaking of the OIG, I am pleased to announce the appointment of Jeffrey E. Schanz as the Corporation's Inspector General, effective March 3, 2008. Mr. Schanz comes to LSC from the U.S. Department of Justice, where he served for the last 17 years as Director of the Office of Policy and Planning, Audit Division, Office of the Inspector General. Mr. Schanz's duties covered the full spectrum of administrative services for the 176-person Audit Division, including budget formulation and execution, development of national and regional training plans, management of a paperless management information system with an audit follow-up component, preparation of semi-annual reports to Congress, and advising the Department on legislation that might impact the IG community.

Mr. Chairman, we are taking these matters very seriously and are giving our highest priority to implementing all of the recommendations with speed and diligence. All of these efforts are in recognition of the fact that stewardship of taxpayer dollars is among our most important responsibilities. Our Board remains proud of this program and the critical role it plays in our nation's justice system and we will continue to ensure that LSC provides the most effective and efficient representation possible of the civil legal needs of the eligible poor throughout this country.

I would be happy to answer any questions at the appropriate time.

Thank you.

Mr. MOLLOHAN. Thank you, Mr. Strickland. President Barnett.

OPENING STATEMENT

Ms. BARNETT. Chairman Mollohan, Congressman Frelinghuysen, thank you very much for holding this hearing and giving me the opportunity to testify on the fiscal year 2009 budget request of the Legal Services Corporation. I also want to thank you for the bipartisan support you continue to provide LSC.

While I know that you share our disappointment in how the budget process ended last year, our community greatly appreciates your efforts in attempting to help close the justice gap.

At the outset, I wish to echo the sentiments of Chairman Strickland regarding the reports of the Government Accountability Office. I want to assure you that I am sincere when I say that we truly embrace those reviews, take them with the utmost seriousness, and welcome the opportunity they afford us to do our job even better.

Oversight of the use of scarce resources is necessary and appropriate. And as Chairman Strickland said, we are responding aggressively to the concerns and recommendations made by GAO. Our job is important and it is vitally important that we carry it out with energy and the proper level of stewardship.

And why is it important? As you know, my entire career has been devoted to providing legal aid to low income persons. I am honored to be the first legal aid attorney to hold the position of President of the Corporation in its 34 year history. I know firsthand what our mission means to the lives of our clients. In fact, civil legal assistance to the poor literally saves lives. When we assisted a young family in Wheeling from being evicted and falling into homelessness, when we saved a battered wife in Memphis from a violent and abusive marriage, when we helped a young mother in South Jersey maintain custody of her little girl, and when we saved a Baltimore grandmother from losing her home to foreclosure, our programs are literally saving the lives of our clients and giving them a chance to be productive members of society.

But legal aid is more than that. In a very direct way it saves money by preventing the downward spiral of the poor into costly public support. Ensuring that our clients are adequately represented in the civil justice system greatly improves their chances of keeping a home rather than moving into a shelter; holding a job rather than going onto public assistance; receiving medical care rather than costly hospitalization; escaping an abusive relationship rather than suffering further injury and even death.

In short, civil legal assistance saves both lives and money. Someone asked me the other day what was the hardest thing I ever had to do as a legal aid lawyer. Without a moment's hesitation I said having to tell someone we couldn't help them knowing they had nowhere else to turn was the hardest task I ever had to do.

Our Justice Gap report has documented that for every eligible client that we are able to assist, one is turned away due to lack of resources. Recent State legal need studies and reports since the Justice Gap report not only affirmed the earlier findings, but showed that the needs may well have been understated in the report.

The Justice Gap report concluded it will take a doubling of the resources from both federal and non-federal sources to fill the Justice Gap. While I am pleased to report a rise in non-federal resources for civil legal aid in 2005 and 2006, in the past year the fiscal problems of many State governments and IOLTA programs have threatened this progress.

The $22 million increase that this Subcommittee was able to give LSC in 2007 was our first federal increase in four years and was a good start. But we need to work with you and the Senate to continue that progress this year.

With respect to the fiscal year 2009 budget, LSC requests an appropriation of $471 million, an increase of approximately $40 million over our fiscal year 2008 request. Again this year more than 95 percent of the request is for basic field grants to programs that provide essential civil legal assistance to low income Americans and for grants to programs to improve efficiency and effectiveness through the use of technology.

Since we testified before this Subcommittee last year, the sub prime mortgage crisis across the country and the rise of foreclosures has overtaken many of our clients and flooded many of our programs with requests for assistance. Renters and senior citizens with fixed incomes are especially vulnerable to be displaced by foreclosure. Our programs across the country are seeing a dramatic increase in calls from people seeking assistance with housing and predatory lending matters. Without additional funding, these programs will be unable to meet this increasing demand for legal services.

In addition, LSC funded programs continue to provide civil legal assistance as part of the recovery process to victims of natural disasters such as hurricane Katrina, fires in Southern California, floods in the Midwest, tornados recently in Tennessee and Arkansas. More than two and a half years after hurricane Katrina, LSC grantees continue to help people with the loss of their homes, jobs, and health care. I know from my own experience with 9/11 in New York City that the legal problems of victims of disasters continue for many years to come.

In conclusion, Mr. Chairman, as you noted at this hearing last year, the appropriation for the Legal Services Corporation amounts to less than half of what was provided in 1981 in inflation adjusted dollars. Fourteen years ago LSC received $400 million from Congress. The LSC Board and I urge you to restore adequate funding for the provision of civil legal aid to the most vulnerable among us.

In this effort the federal government must lead the way consistent with its role in fulfilling the promise of our constitution, the promise inscribed on the Supreme Court Building, “Equal justice under law.” I can assure you that your support will not only help fulfill the promise, it will literally save more lives.

Thank you and I would be happy to answer your questions.

[Written testimony of Helaine M. Barnett, President, Legal Services Corporation]

Submitted 4/2/08

Testimony of

Helaine M. Barnett
President, Legal Services Corporation

Before the
Subcommittee on Commerce, Justice, Science, and Related Agencies
Committee on Appropriations
House of Representatives

April 2, 2008

Chairman Mollohan, Congressman Frelinghuysen, and Members of the Subcommittee, thank you very much for holding this hearing and for giving me the opportunity to testify on the Legal Services Corporation's (LSC) Fiscal Year 2009 Budget Request. I also want to thank you for the bipartisan support you continue to provide to LSC. While I know that you share my disappointment in how the budget process ended last year, your efforts in attempting to close the justice gap were greatly appreciated by our community.

The Legal Services Corporation is the single largest source of funding for civil legal aid for low-income individuals and families. We fund 137 programs with more than 900 offices serving every Congressional district. More than 95 percent of LSC appropriations are distributed to these programs. The Corporation provides guidance, training and oversight to ensure that programs provide high-quality legal services and comply with Congressional restrictions, LSC rules, and regulations.

At the outset I wish to echo the testimony of Chairman Strickland regarding the reports of the Government Accountability Office. I want to assure you that we truly embrace these reviews, take them with the utmost seriousness, and welcome the opportunity that they afford us to do our job even better. As pointed out in the testimony of Chairman Strickland, we are working diligently and expeditiously to implement the GAO's recommendations and are even going beyond what was specifically recommended in the reports.

STEWARDSHIP OF TAXPAYER DOLLARS AND SERVICES TO OUR CLIENTS

All of this effort is in recognition of the fact that stewardship of taxpayer dollars is among our most important responsibilities. Eligible clients need the critical services that we provide with those dollars.

Our programs' clients, the most vulnerable among us, live at or below 125 percent of the federal poverty level—an income of about $25,000 a year for a family of four. Three out of four are women, many of whom are mothers struggling to keep their families together and their children safe, fed and housed.

The clients of LSC-funded programs are of all races and ethnicities, young and old, the working poor, people with disabilities, families with children, veterans, victims of domestic violence, and victims of natural disasters. LSC-funded programs make a meaningful difference in the lives of their clients—helping them secure basic human needs such as safe and habitable housing, an adequate source of income, access to needed health care, and protection from abusive relationships.

As you know, my entire legal career has been devoted to providing legal aid to low-income persons. I am honored to be the first legal aid attorney to hold the position of President of the Corporation in its 34-year history. I know first hand what our mission means to the lives of our clients. Civil legal assistance to the poor literally saves lives. When we assisted a young family in Wheeling from being evicted and falling into homelessness; when we saved a battered wife in Memphis from a violent and abusive marriage; when we helped a young mother in South Jersey maintain custody of her little girl; and when we saved a Baltimore grandmother from losing her home to foreclosure, our programs are literally saving the lives of our clients and giving them the chance to be productive members of our society.

But legal aid is more than that. In a very direct way it saves money by preventing the downward spiral of the poor into costly public support. Ensuring that our clients are adequately represented in the civil judicial system greatly improves their chances of keeping their home rather than moving into a shelter, holding a job rather than going onto public assistance, retaining custody and support of their children rather than losing them to foster care, receiving needed medical care before requiring costly hospitalization, escaping an abusive relationship rather than suffering further injury or even death. In short, civil legal assistance saves both lives and money

SUBPRIME MORTGAGE CRISIS AND CONTINUED IMPACT OF NATURAL DISASTERS

Since we testified before this subcommittee last year, the subprime mortgage crisis across the country and the rise of foreclosures has overtaken our clients and flooded many of our programs with requests for assistance. Renters and senior citizens with fixed incomes are especially vulnerable to being displaced by foreclosure. Our programs across the country are seeing a dramatic increase in calls from people seeking assistance with housing and predatory lending matters. In some instances, the number of foreclosure-related cases handled by our programs has doubled. Many of our programs have also established special projects specifically dedicated to addressing foreclosure-related cases. We expect this demand for legal assistance to continue to grow. Without additional funding, these programs will be unable to meet this increasing demand related to foreclosures and evictions.

LSC-funded programs continue to provide civil legal assistance as part of the recovery process to victims of natural disasters such as Hurricane Katrina, the fires in southern California, the floods in the Midwest and Northwest, and the recent tornadoes in

Tennessee and Arkansas. Problems for victims of natural disasters continue far beyond their wake. More than two and a half years after Hurricane Katrina, LSC grantees continue to help people with the loss of their homes, jobs and healthcare benefits. I know from my own experience in New York City with the impact of 9/11 that the need will continue for many years to come.

Just as the need for legal aid is growing, the number of poor Americans eligible to receive civil legal aid is growing. Eight years ago, 44 million Americans qualified for LSC-funded services. Today, nearly 50 million poor Americans qualify.

2009 BUDGET REQUEST

LSC requests an appropriation of $471,362,000 for FY 2009, an increase of $40,681,000 over the FY 2008 request. Again this year, more than 95 percent of the request is for basic field grants and for grants to programs to improve efficiency and effectiveness through the use of technology.

LSC continues to be guided in our funding request by the September 2005 report, *Documenting the Justice Gap in America: The Unmet Civil Legal Needs of Low-Income Americans*. LSC's Justice Gap Report documents that 50 percent of low-income Americans who are eligible to receive civil legal assistance and who come to LSC-funded programs for help are turned away due to lack of adequate program resources. State legal needs studies and reports, since the release of the Justice Gap Report, not only affirm its conclusions, but indicate that the needs may well have been understated. For example:

- **New Mexico,** 80 percent of the legal needs of low-income New Mexicans are unmet.[1]
- **New Jersey,** 99 percent of defendants in housing eviction cases go to court without a lawyer.[2]
- **Utah**, 87 percent of poor households facing a legal problem do so without an attorney.[3]
- **Nebraska**, 86 percent of eligible clients with a legal problem are unable to receive help from Legal Aid of Nebraska, the statewide LSC-funded program.[4]
- **Wisconsin**, 80 percent of poor households facing a legal problem do so without an attorney.[5]

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[1] *Report to the Supreme Court of New Mexico*. New Mexico Commission on Access to Justice. March 2006.

[2] *People Without Lawyers: The Continuing Justice Gap in New Jersey*. Legal Services of New Jersey. October 2006.

[3] *The Justice Gap: The Unmet Legal Needs of Low-Income Utahans*. Utah Legal Services. January 2007.

[4] *State Needs Assessment*. Legal Aid of Nebraska. February 2007.

- **California**, 67 percent of the legal services needs of low-income Californians are unmet.[6]
- **Maine**, 75 percent of the litigants in the civil justice system are not represented by counsel.[7]
- **Hawaii,** 80 percent of low- and moderate-income residents have unmet legal needs.[8]
- **Arizona,** 75 percent of Arizonans with civil legal needs are not represented by an attorney.[9]

The following chart compares LSC's request for FY 2009 with the FY 2008 appropriations and the FY 2008 request.

Budget Line Item	FY 2008 Budget Request	FY 2008 Appropriation	FY 2009 Budget Request	FY09 Request v. FY08 Request
Basic Field	$407,815,000	$332,390,000	$445,200,000	$37,385,000
Technology Initiatives	$5,000,000	$2,100,000	$5,000,000	$0
Loan Repayment Assistance Program	$1,000,000	$500,000	$1,000,000	$0
Management & Administration	$13,825,000	$12,500,000	$17,000,000	$3,175,000
Office of Inspector General	$3,041,000	$3,000,000	$3,162,000	$121,000
TOTAL	**$430,681,000**	**$350,490,000**	**$471,362,000**	**$40,681,000**

LSC's request represents another significant increase in Basic Field grants to fulfill our Board's plan to close the justice gap in America. As LSC's Justice Gap Report concluded, there needs to be a doubling of both federal and non-federal funding to serve those eligible clients that are currently being turned away. Non-federal funding has shown a $100 million increase in the period between 2005 and 2007. While it is clear that this subcommittee remains supportive of LSC, federal funding has lagged behind in this effort. Fourteen years ago, the federal appropriation for LSC was $400 million.

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[5] *Bridging the Justice Gap: Wisconsin's Unmet Legal Needs.* State Bar of Wisconsin Access to Justice Committee. March 2007.

[6] *Action Plan for Justice.* California Commission on Access to Justice. April 2007.

[7] *Justice for All.* Justice Action Group. October 2007.

[8] *Achieving Access to Justice for Hawaii's People.* Access to Justice Hui. November 2007.

[9] *Voicing a Need for Justice.* Arizona Foundation for Legal Services and Education. January 2008.

This year's request would bring Basic Field Grants to $445.2 million. The amount of the increase is 20 percent more than the FY 2008 Senate-passed total for Basic Field Grants of $371 million. This is the same percentage increase requested in each of the last two years.

In addition to recommending $445.2 million for Basic Field Grants, LSC requests $5 million for Technology Initiative Grants. Technology improvements allow LSC grantees to deliver more assistance at a lower cost. For FY 2009, we plan to expand intake through online systems; expand assistance for *pro se* litigants through the development of additional automated forms; explore innovative uses of new technologies; and provide support for replication of technologies that have been demonstrated to both improve and expand client services.

LSC requests $1 million to extend the pilot Loan Repayment Assistance Program (LRAP). The LSC LRAP is designed to assess the extent to which loan repayment assistance enhances the ability of LSC grantees to recruit and retain high-quality staff. It provides participants up to $5,000 for three years ($15,000 total) in loan repayment assistance. Initial assessments of our first year program found that loan repayment assistance substantially enhances attorneys' ability to work in legal services and enhances programs' ability to recruit and retain staff. Participants in the LSC program report that the loan repayment assistance significantly increased the likelihood that they would stay with their program. An additional $1 million will allow LSC to extend its three-year pilot program and enable LSC to help more attorneys and provide a larger pool to evaluate the impact on the ability of LSC-funded programs to recruit and retain attorneys. While Congress has included a loan repayment assistance provision in the Higher Education Act of 2007 to be administered by the Department of Education, that program will require more than a year to be funded and implemented, necessitating the continuation of our pilot at least through 2009.

LSC requests $17 million for Management and Administration. The additional resources will be used to expand LSC's oversight of grantee compliance with regulations and congressional restrictions and to help enhance the quality of grantee services. This increase is necessary in light of the GAO reports and our efforts to implement all the recommendations to strengthen the Corporation's oversight of our 137 grantees. In order to effectively implement improved oversight, we need more staff.

The Office of Inspector General requests $3.1 million for FY 2009, and that number is included in a total recommended request for LSC of $471.3 million.

STRONGER CONTROLS, INCREASED FUNDING

As we strive to improve and strengthen our internal controls and oversight responsibilities, we know that LSC cannot fully realize its mission as long as the justice gap endures. We need a multi-pronged effort to secure more resources both from the public and the private sector. In this effort, the federal government must lead the way consistent with its role in maintaining the formal civil justice system, providing for the orderly resolution of disputes, and providing an avenue to equal justice for all. State and local governments, private funding sources, and the private bar are critical partners and share the responsibility for increasing their contributions, both of funding and service. While we have a long way to go to close the justice gap, we greatly appreciate all your efforts to help us reach our goal.

As you noted at this hearing last year, Chairman Mollohan, congressional appropriations for the Legal Services Corporation amount to less than half of what was appropriated for LSC in 1981 in inflation-adjusted terms. The LSC Board and Management urge you to restore adequate funding for the provision of civil legal aid to the most vulnerable among us. We urge this Subcommittee to help close the justice gap by approving our FY 2009 budget request of $471 million.

FUNDING

Mr. MOLLOHAN. Thank you, Ms. Barnett. You raised the issue of your funding in the past years in comparable dollars what would your request be this year if you were to receive the appropriation you received in 1995, which in your chart here is $400 million? Do you know the answer to that?

Ms. BARNETT. Probably more than, certainly more than what we are asking for and probably closer to the seven hundreds.

Mr. MOLLOHAN. I would guess.

Ms. BARNETT. I am getting the——

Mr. MOLLOHAN. Well you can get a better number for the record.

[The information follows:]

Congress appropriated $400 million to LSC for fiscal year 1995. Had LSC's funding kept pace with inflation with its 1995 level, LSC would be receiving $555.6 million today. In addition, if LSC's funding had kept pace with inflation on our FY 1980 funding level of $300 million (high-water mark), our funding level today would be $770.7 million.

Ms. BARNETT. Certainly.

Mr. MOLLOHAN. But I am sure that is right. So your request is considerably lower than what your highest funding level was some——

Ms. BARNETT. Fourteen years ago.

Mr. MOLLOHAN. Fourteen, thirteen, fourteen years ago. Well Legal Service Corporation has certainly been looked at here. The IG last year, the GAO this year. And you have embraced the recommendations which seems don't know how you could be more responsive. And you are in the process of developing methods and procedures and requesting funding so that you can even expand your oversight capabilities, both financial activities and programmatic activities. Is that correct?

Mr. STRICKLAND. Correct.

GAO

Mr. MOLLOHAN. Chairman Strickland, do you want to speak to that a little more than you did in your testimony? And in regard to the nature of the concerns that GAO has come up with and how you think that defines the Legal Services Corporation today.

Mr. STRICKLAND. Well I think the Board has been extraordinarily responsive to the report on governance of the Corporation. As I outlined, we moved very quickly on that at the January meeting here in Washington and we continue to move ahead on that.

As I said, we have already adopted a comprehensive code of ethics and conduct. That is already in place. That is for the whole organization, not just for the Board. Another recommendation that the GAO had for us was to develop a continuity of operations plan. That is not in place, but it is well under way in terms of its development.

We are also looking at a number of things that are in the category of best practices, best management practices, so that we can adopt a program for LSC that fits us as opposed to some much larger organization.

And the most recent thing we did, which was something that the GAO, as I recall it, asked us to consider, and that is whether to have a separate audit committee. We did have that function under our Finance Committee and our Ad Hoc Committee which was appointed in January, brought to us a recommendation that we should have a separate audit committee. And the Board in a conference call meeting within the past couple of weeks accepted that recommendation and approved a charter for the audit committee, and delegated to me as is typical for an appointment of committees, that responsibility. So I have appointed the Audit Committee and the Board also approved a charter for the Audit Committee.

So we have taken a number of steps.

Mr. MOLLOHAN. What would be the responsibilities of the Audit Committee?

Mr. STRICKLAND. The Audit Committee will work in conjunction with the Inspector General relying on the professional side of the equation and looking to the IG to bring recommendations for LSC's outside accounting firm, which performs an annual audit of LSC's books and records.

So the IG and the Audit Committee of the Board will work together in that effort to select the auditor, oversee the audit function itself, receive and review the annual report from the accounting firm and then bring that to the Board.

Mr. MOLLOHAN. Ms. Barnett, are all of your programs audited across the nation?

Ms. BARNETT. Yes, Mr. Chairman. Every LSC grantee is required by the LSC Act to have a financial audit each year. And in 1996 Congress and the Appropriations Act actually designated the independent public accountants to be under the supervision of the Office of the Inspector General. And the audits have to be completed on an annual basis. They are given to the Office of the Inspector General who is to refer to management any findings that need followup.

Mr. MOLLOHAN. So typically a local program would hire a local accounting firm to conduct an audit of that particular program at that site?

Ms. BARNETT. That is correct.

Mr. MOLLOHAN. And do they have a uniform set of criteria besides what normally the accountants look at in order to judge the program by?

Ms. BARNETT. Well, the Office of the Inspector General has an audit guide and a compliance supplement that they are given. I think as a result of the GAO recommendations on grants management and oversight, we are working with the Office of the Inspector General and with the Board to clarify the roles and responsibilities of fiscal oversight. And to give guidance, further guidance, to both the auditors and to our grantees in their accounting manual with regard to the financial audits.

Mr. MOLLOHAN. So you are tightening up the financial requirements for your local programs?

Ms. BARNETT. We are certainly looking to give better guidance to the IPA's and to our programs. And as I said where we are working to clarify the roles and responsibilities and to improve our information sharing. So that I think as a result of the GAO report that is what will happen.

HIRING

Mr. MOLLOHAN. Now you are requesting increased funding to hire additional personnel at the LSC offices. Could you tell us what that increased funding is for and what capabilities you need to be hiring?

Ms. BARNETT. I will be happy to. At the moment the Corporation has 88 persons in our Washington Headquarters office. Roughly half are devoted to our two offices that do oversight in terms of looking at program quality and compliance with regulations, rules, and the LSC Act.

We have asked for an increase from $12.5 million to $17 million. That would basically provide additional staff for those two offices to permit us to do more of the oversight, more visits in the field. The total request, I would point out, is only 3.8 percent of the total request for administration that we are requesting.

So I think we are low by any standard. But we do feel we need more staff in order to be able to make more visits in the field. We do have 137 programs with 900 offices throughout the country, and the staff we are asking for, by the way, also includes management support. It is not everybody that can go to the field. But that is the basis for our request for management administration this year.

Mr. MOLLOHAN. Okay. Thank you. Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Again, I welcome both of you. The first GAO report was issued in August, is that right?

Mr. STRICKLAND. Correct.

Mr. FRELINGHUYSEN. September of last year. And that first report indicated that a properly implemented governance and accountability structure might have prevented questionable expenditures in the incident where pay exceeded statutory caps.

As a general question, I understand the notion from Mr. Strickland's testimony, "We have accepted all the recommendations." That is accepting responsibility. And, you know, I am a supporter of the Legal Services Corporation. How many of the recommendations actually have been resolved?

Mr. STRICKLAND. Well——

Mr. FRELINGHUYSEN. I understand the exceptions noted, but how many have actually been resolved?

Mr. STRICKLAND. Well, for example, it was recommended that we establish a code of ethics and conduct. We have done that. It was recommended we have a continuity of operations plan. We are in the first phase of developing that plan. It is not quite as easy to develop that as it is a code of ethics and conduct.

It was recommended that we make a decision on the use of the Government Accounting Standards Board guidelines for our financial statements. We have adopted that.

There was a recommendation that we establish a separate audit committee. We have done that.

Mr. FRELINGHUYSEN. Lets just focus on that just for a——

Mr. STRICKLAND. On the Audit Committee?

Mr. FRELINGHUYSEN. You established a separate Audit Committee of the Board, which I think obviously is beneficial. Can you describe to the Committee what the Committee's charter is?

Mr. STRICKLAND. Well the charter is, I don't have it, but it is a fairly detailed charter. It runs on for several pages, but the essence of it is, and by the way, that——

Mr. FRELINGHUYSEN. More importantly, if you know if there is specific responsibilities what are they doing under the charter, the new vehicle, that they weren't doing before maybe in a general sense?

Mr. STRICKLAND. The Audit Committee as I mentioned has just been established in the past 30 days. And it has not had its first meeting. It will have its first meeting at the end of April at our Board meeting scheduled for that time.

Mr. FRELINGHUYSEN. So has the Committee's charter—is there a charter?

Mr. STRICKLAND. Yes, sir. There is a written charter, the charter was adopted.

Mr. FRELINGHUYSEN. The charter I assume embodies certain principles?

Mr. STRICKLAND. Yes. And I outlined——

Mr. FRELINGHUYSEN. And are they remarkably different than what you have been operating under in your prior life or?

Mr. STRICKLAND. I think they are considerably more detailed. What we had been operating under for a number of years were the typical corporate bylaws for LSC as a Corporation. The more current thing to do both in publicly traded corporations and non-profits is to have charters, that is a much more detailed outline of the responsibilities of Board Committees.

So as I mentioned, we now have a much more detailed charter for our Audit Committee, which I think will enable that Committee to give much sharper focus to the oversight of LSC's financial statements and its own audit.

The entire focus of the Board's Audit Committee is it doesn't really have anything to do with our grantees. It has to do with——

Mr. FRELINGHUYSEN. But the grantees themselves are audited.

Mr. STRICKLAND. Oh, yes. But they are not——

Mr. FRELINGHUYSEN. So under the purview of the Audit Committee surely would come the audits which would, I assume, be annually submitted by all of those programs under your area of responsibility?

Mr. STRICKLAND. Correct. But the responsibility for overseeing the independent audits of our grantee programs rests in the Office of Inspector General.

Mr. FRELINGHUYSEN. What does the new Committee do then?

Mr. STRICKLAND. The new Committee's function is the oversight of LSC's own books and records, its internal functions. Overseeing its own independent public accounting. The selection of that accounting firm working with the auditor on LSC's audit. And receiving that report and presenting it to the Board.

Mr. FRELINGHUYSEN. Is this new Committee different? Well how is it different from what you had before?

Mr. STRICKLAND. Well before it was combined with our Finance Committee, which is primarily on the budget side of the equation. And as an adjunct it had a general responsibility for the audit. But it was almost entirely delegated, in fact it was entirely delegated to the Office of Inspector General to select the auditor, to oversee the audit, and to bring the auditor to the Board.

So the——

Mr. FRELINGHUYSEN. So now the Board members take——

Mr. STRICKLAND. Now the Board members are right in the thick of it.

Mr. FRELINGHUYSEN. In the thick of it.

Mr. STRICKLAND. Right in the thick of it. That is the big distinction.

NEW CODE OF ETHICS

Mr. FRELINGHUYSEN. Your testimony describes a new code of ethics, new orientations and evaluation for Board members and the adoption of charters for each Board Committee. How many Board members are there? How regularly do they meet? And what is the time commitment that each of them makes in order to serve?

Mr. STRICKLAND. The Board as a matter of law has 11 members. It is a bipartisan Board, also by law. We currently have ten members. One of our client Board members died and we have not brought on a replacement or the President has not appointed a replacement to the Board. So we have ten members. And we are, again, required by law to meet no less than four times per year. And in my tenure on the Board, which is just this month ending or actually—or yes, five years, we have met I would say on the average of seven to nine times each year. Four times in person and the balance in extended conference call meetings.

Mr. FRELINGHUYSEN. I think that is hugely admirable. In your testimony you described the new code of ethics. Is every member been run through that process and do they familiarize themselves with should we say the new posts?

Mr. STRICKLAND. It as you can tell from the discussion here the GAO report was issued last September. And between then and now, which is roughly six months, we have adopted some charters. They are all new to the Board. And the Board, I would say it is a fair statement that it is just getting acquainted with the essence of each of these charters.

Now all the charters are not done yet. We have now with the Audit Committee, four standing committees of the Board. So the Audit Committee has its charter. The other charters are works in progress and are not yet in place.

NEW REQUIREMENTS FOR BOARD MEMBERS

Mr. FRELINGHUYSEN. Well I am not sure I fully understand it, but will all the new requirements for Board members be in place by the end of the year?

Mr. STRICKLAND. Oh, absolutely.

Mr. FRELINGHUYSEN. They will be?

Mr. STRICKLAND. No question.

Mr. FRELINGHUYSEN. And, lastly, the GAO also made some recommendations to Congress to consider making changes in law to Legal Services Corporation governance and accountability requirements, you are familiar with some of those recommendations?

Mr. STRICKLAND. I don't know that I—are you inquiring about the governance or a change in structure?

Mr. FRELINGHUYSEN. Governance and accountability requirements.

Mr. STRICKLAND. Some that are different from those in the GAO report?

Mr. FRELINGHUYSEN. I am not sure that you need to ask me the question.

Mr. STRICKLAND. I am trying to——

Mr. FRELINGHUYSEN. I am trying to figure out whether——

Mr. STRICKLAND. I am trying to clarify.

Mr. FRELINGHUYSEN [continuing]. If you are familiar with what the GAO has recommended.

Ms. BARNETT. Congressman Frelinghuysen?

Mr. FRELINGHUYSEN. And do you agree that the changes they have recommended are necessary to ensure proper oversight?

Mr. STRICKLAND. As we have said, we have accepted all the recommendations and we are working diligently to implement our responses to those and many of those are already in place. And we fully embrace them and intend to comply with all of them.

Ms. BARNETT. Congressman Frelinghuysen, if I could offer to please, as part of the record, we would send you the charter that was newly adopted for the Audit Committee and the code of ethics and conduct. And, yes, I would say every Board member is completely familiar with that code. We are in the process of ensuring that all our employees are familiar with it. They are going to have to acknowledge receipt and agree to abide by it.

So I think that surely I would have answered by the end of the April Board meeting, I think, the Board is going to have acted on that.

[The information follows:]

CHARTER OF THE
AUDIT COMMITTEE OF
LEGAL SERVICES CORPORATION

I. Establishment

On March 24, 2008, the Board of Directors ("Board") of the Legal Services Corporation ("LSC" or "Corporation") established, as a standing committee of the Board, a committee to be known as the Audit Committee (the "Committee"), and adopted this as the Committee's Charter.

II. Purposes

The purpose of the Committee shall be to assist the Board in fulfilling its responsibility to ensure that the Corporation's assets are properly safeguarded; to oversee the quality and integrity of the Corporation's accounting, auditing, and reporting practices; and to perform such other duties as assigned by the Board.

III. Membership

The Chairman of the Board ('Chairman") shall appoint at least three Directors other than the Chairman to serve on the Committee. The Chairman shall appoint the Chair of the Audit Committee from among these Directors. Three Committee members will be required in order to constitute a quorum. No member of the Committee may be an officer or employee of the Corporation. To the extent practicable, Members of the Committee should have at least a basic understanding of finance and accounting, be able to read and understand fundamental financial statements, and understand the Corporation's financial operations and reporting requirements.

IV. Terms

Members of the Committee shall serve for a term of one year, or until their earlier resignation, replacement or removal from the Committee or Board.

V. Meetings

The Committee:

(1) shall meet at least four times per calendar year, but may meet more frequently at the call of any member of the Committee;

(2) may adopt procedural rules that are not inconsistent with this Charter, the Corporation's Bylaws, or the laws to which the Corporation is subject.

VI. Resources

All offices, divisions and components of the Corporation ("Management"), including the Office of Inspector General ("OIG") shall cooperate with all requests made by the Committee for information and support. The Committee shall be given the resources necessary to carry out its responsibilities.

VII. Authority

The Committee:

(1) unless otherwise directed by the Board, shall oversee the selection and retention of the external auditor ('External Auditor(s)") by the Inspector General ("IG") of the Corporation;

(2) shall have unrestricted access to the Corporation's books, records, facilities, personnel, and External Auditor(s);

(3) is authorized to carry out the duties and responsibilities described in this Charter, as well as any other activities reasonably related to the Committee's purposes or as may be directed by the Board from time to time;

(4) may delegate authority to one or more designated members of the Committee;

(5) may rely on the expertise and knowledge of Management, the OIG, External Auditor(s), and such consultants and experts that the Board approves for carrying out its oversight responsibilities;

(6) may authorize to be conducted, or itself conduct, reviews into any matters within the scope of its responsibilities; and

(7) may require any person, including the External Auditor or any officer or employee of the Corporation, to attend Committee meetings or to meet with any member(s) of or advisor(s) to the Committee.

VIII. Duties and Responsibilities

The Committee:

(1) shall review with Management, the OIG, and the Corporation's External Auditor(s) the contemplated scope and plan for LSC's required annual audit;

(2) shall review and discuss with the External Auditor(s), the OIG, and Management the annual audit report and results of the External Auditor's year-end audit, including any problems or difficulties encountered by the

External Auditor(s); the OIG and the Management's response to any audit findings, and any areas of significant disagreement between Management, the OIG, and the External Auditor(s); and any recommendations of the External Auditor(s);

(3) shall in concert with the OIG annually review and confirm the independence of the External Auditor(s);

(4) shall review with the OIG its internal audit responsibilities, sanctions, and performance; its internal audit plan and the risk assessment that drives its internal audit plan; and the effectiveness of its internal audit plan and activities;

(5) shall consult with the IG as to an appropriate approach regarding communications and meetings between the Committee and the OIG;

(6) shall confirm the existence of appropriate monitoring of LSC's internal controls preventing or disclosing activities prohibited by statute, regulations or applicable circulars of the Office of Management and Budget;

(7) shall, in conjunction with the Board's Finance Committee, review, monitor, and evaluate the effectiveness and execution of the Corporation's policies and procedures with respect to identifying and managing financial and other risk exposures, and to assess the steps Management has taken to identify and control such risks to the Corporation;

(8) shall review Management representation letters or certifications and the LSC Finance Committee chairperson's letters or certifications regarding the contents, accuracy, or completeness of financial reports, as appropriate;

(9) shall establish procedures for the receipt, retention, and treatment of complaints or expressions of concern regarding accounting, internal controls and auditing issues, and which procedures should provide for the anonymity and confidentiality of such communications from employees;

(10) shall review and discuss with the OIG all significant matters relative to their financial audits and conduct of financial audits performed by the OIG, including any problems the OIG encountered while performing their audits;

(11) shall ensure that significant findings and recommendations made by the OIG and External Auditor(s) are addressed and, where appropriate, implemented by Management and/or the Board on a timely basis;

(12) shall report to the Board at least twice per calendar year and on such other occasions as requested to do so by the Board;

(13) shall review all regulatory and internal control matters that may have a material effect on the Corporation's financial statements;

(14) shall periodically assess the Committee's performance under the Charter, reassess the adequacy of the Charter, and report to the Board the results of the evaluation and any recommendations for proposed changes to the Charter;

(15) shall review any significant deficiencies in internal control over financial reporting identified by Management, the IG, or the External Auditor(s) and ensure that corrective action is taken by Management; and

(16) shall perform such other duties, consistent with this Charter, as are delegated to the Committee by the Board.

IX. Limitations

(1) Nothing contained in this Charter is intended to expand the applicable standards of liability under statutory or regulatory requirements for the Board or its Directors.

(2) Members of the Committee are entitled to rely on the expertise, knowledge, and judgment of Management, the Inspector General, and the External Auditor(s) and any consultant or expert retained by them. The Committee's responsibilities are not to be interpreted as a substitute for the professional obligations of others.

(3) It is not the duty of the Committee to conduct audits or to determine that the Corporation's financial statements are in accordance with generally accepted accounting principles, generally accepted government auditing standards (the "Yellow Book") and other applicable rules, regulations, guidelines and instructions. These are the responsibilities of the OIG, the External Auditor(s) and Management.

(4) Nothing contained in this Charter shall be construed as circumscribing the authority of the Inspector General under the Inspector General Act or is intended to restrict the authority of the Inspector General to conduct, supervise, and coordinate audits and investigations relating to the programs and operations of the Corporation.

LEGAL SERVICES CORPORATION
CODE OF ETHICS AND CONDUCT

As adopted by the LSC Board of Directors March 24, 2008

I. Purpose

The Legal Services Corporation ("LSC" or "Corporation") maintains and enforces the highest standards of ethics and conduct. LSC expects all members of the Board of Directors (Directors), officers, and employees to perform their work with the utmost honesty, truthfulness, and integrity.

The purpose of this Code of Conduct ("Code") is to establish LSC's expectations for individual behavior, to provide basic guidelines for situations in which ethical issues arise, and to assist Directors, officers, and employees to carry out daily activities within appropriate ethical and legal standards. These ethical and legal standards apply to all of our business relationships and activities, including but not limited to those involving grantees, applicants, consultants, and vendors, as well as with one another. This Code is not intended to confer a legal right of action upon Directors, officers, employees, or third parties.

II. Compliance

LSC's Directors, officers, and employees are required to comply with this Code and with all laws, rules, regulations, and policies pertaining to LSC and to act in the best interests of LSC. This means following both the letter and spirit of the law. When compliance questions arise, employees should seek advice from their supervisors, managers, the Office of Legal Affairs, or the Ethics Officer. The Board of Directors shall designate an official to serve as the Ethics Officer for the Corporation.

The policies and procedures set out in this Code are applicable to the Office of the Inspector General, except in the event that they are inconsistent with the provisions of the Inspector General Act or other applicable laws. The Inspector General shall designate an official to function as the Ethics Officer for members of the Office of Inspector General, subject to ratification by the Board of Directors. Whenever any other LSC official or office is designated as the authority for taking or approving an action in this Code, the Inspector General or designee will replace such official or office with respect to an action or decision affecting the OIG.

III. Leadership Responsibilities

LSC's Directors, officers, and managers have a special obligation to help create a culture within LSC that promotes the highest standards of ethics and compliance. All employees shall have sufficient information, training, and guidance to comply with all laws, regulations, and policies pertaining to LSC, as well as access to the Ethics Officer to help resolve ethical dilemmas.

IV. Conflicts of Interest

A "conflict of interest" exists whenever a Director's, officer's, or employee's private interests could reasonably be seen as influencing, directly or indirectly, the individual's duty to act in the best interests of LSC. Interests, transactions, and relationships of an individual's family members may also give rise to conflicts.

LSC's Directors, officers, and employees shall refrain from entering into relationships or transactions that constitute a conflict of interest. Even relationships or transactions that give the appearance of a conflict should be avoided. If a conflict or apparent conflict does arise the individual must disclose and resolve it as described below. If in doubt about the potential for conflicts, the Ethics Officer should be consulted. See also the subsection on Directors, below.

There are many different ways in which conflicts of interest arise. For example, private interests, obligations to another company or governmental entity, or the desire to help a relative or friend are all factors that might make it difficult for a Director, officer, or employee of LSC to perform his or her work objectively and effectively. Further guidance on avoiding conflicts may be found in the LSC Employee Handbook, especially those sections covering outside employment (§ 5.4), using time and assets for personal benefit (§ 11.6), and acceptance of gifts (§ 11.12).

Officers and Employees

Any officer or employee who becomes aware of a conflict or a potential conflict within LSC shall bring it to the attention of their supervisor or the Ethics Officer. If an employee's supervisor is the Ethics Officer, the employee may bring a conflict to the attention of the President instead. Supervisors shall notify the Ethics Officer of any conflicts or potential conflicts called to their attention as well as any actions taken to resolve the issues. Officers and employees who believe it is not possible to avoid a conflict of interest must make full written disclosure of the surrounding circumstances to their supervisor, who shall bring it to the attention of the Ethics Officer. The Ethics Officer will make a final determination regarding the need for any limitations on the individual's involvement in the relationship, transaction, or decision.

Conflicts of interest involving the Ethics Officer must be disclosed to the LSC President and to the Board of Directors. The President of LSC shall disclose any potential conflict of interest involving the President to the Board. Such disclosures shall be made to the Chairman of the Board, or to a committee designated by the Board for this purpose, who will make a determination regarding the need for any limitations on the Ethics Officer's or President's involvement. The Ethics Officer will be notified for record-keeping purposes of the report and any action taken in response to it.

Officers and employees must avoid situations in which they might profit financially from LSC activities. If an officer or employee becomes aware of a personal affiliation or involvement (including seeking future employment) with an organization applying for or receiving an LSC grant or otherwise competing for LSC business, the individual must fully disclose the nature of such affiliation or involvement to his or her supervisor and the Ethics Officer. The supervisor shall recommend, and the Ethics Officer shall make a final determination, regarding any appropriate limitations on the individual's involvement with the transaction or decision.

Directors

The LSC Act provides that no member of the Board may participate in any decision, action, or recommendation with respect to any matter which directly benefits such member or pertains specifically to any firm or organization with which such member is then associated or has been associated within a period of two years. Moreover, Directors have fiduciary duties to the Corporation including a duty of loyalty, which entails the duty to avoid conflicts of interest or to abstain from decision-making involving existing conflicts. Any Director who becomes aware of a conflict or a potential conflict within LSC shall bring it to the attention of the Ethics Officer and the Board of Directors.

Whenever a Director or officer has a private interest in any matter coming before the Board of Directors, the affected person must fully disclose the nature of the interest and withdraw from discussion and voting on the matter. Any transaction or vote involving a potential conflict of interest shall be approved only when a majority of disinterested Directors determine that it is in the best interest of LSC to do so. The minutes of the meetings at which such votes are taken shall record such disclosure, abstention, and rationale for approval.

Directors must avoid situations in which they might profit financially from LSC activities. If a Director becomes aware of a personal affiliation or involvement (including seeking future employment) with an organization applying for or receiving an LSC grant or otherwise competing for LSC business, the individual must fully disclose the nature of such affiliation or involvement in writing to the Ethics Officer and the Board of Directors. The Ethics Officer, in conjunction with the Board of Directors, shall make a determination about any appropriate limitations on the individual's involvement with the decision.

V. Restricted Political Activities

LSC officers and employees must comply with certain restrictions on political activity, which are imposed by the LSC Act and regulations. Specifically, LSC officers and employees shall not intentionally identify LSC with the political activity of any party, association, or candidate. They must comply with the same federal "Hatch Act" restrictions on political activity that apply to state and local officials, which include prohibitions on using official authority (including official titles) to influence elections; advising or coercing a covered employee to contribute to a party, group, or person for political purposes; and running for political office in a partisan election. *See* 42 U.S.C. § 2996e(e)(2); 5 U.S.C. §§ 1501 *et seq*. LSC Directors, officers, and employees may not use any political test or qualification in taking personnel actions or administering grants.

The Office of Legal Affairs and the U.S. Office of Special Counsel are available as resources to provide information and advice concerning Hatch Act restrictions.

VI. Fair Dealing

Each Director, officer, and employee must endeavor to respect the rights of, and deal fairly with, LSC's grantees, applicants, stakeholders, suppliers, consultants, and employees. No one may abuse his or her authority or take unfair advantage of anyone through manipulation, concealment, abuse of privileged information, misrepresentation of material facts, or any other intentional unfair-dealing practice. LSC's Directors, officers, and employees may not receive gifts or loans in connection with their LSC business dealings. Token gifts may be accepted in accordance with the LSC gift policy in the LSC Employee Handbook, Section 11.12. Anyone found to be soliciting, receiving, accepting, or condoning a bribe, kickback, or other unlawful payment, or attempting to initiate such activities, will be subject to termination and referral to law enforcement authorities for possible criminal proceedings.

VII. Confidentiality

LSC, by law and regulation, will make information and records concerning its operations, activities, and business available to the public to the maximum extent possible. Records will be withheld from the public only in accordance with the Freedom of Information Act, the LSC Act and regulations, and other applicable laws. However, LSC's Directors, officers, and employees must take reasonable care to avoid disclosure of confidential information, including exercising due care with regard to LSC records. The obligation to preserve confidential information continues even after employment with LSC or service on the Board of Directors ends.

VIII. Recordkeeping

LSC requires honest and accurate recording and reporting of information in order to make responsible business decisions. In the course of their work, Directors, officers, and employees will create or receive LSC records in electronic and hardcopy form, including but not limited to e-mails, internal memoranda, voicemail, letters, charts, graphs, visual materials, and reports. Records created or received during the course of LSC business are LSC property and, regardless of their location, do not belong to the individual who created, received, or maintained them. All records of LSC should be kept according to approved retention and disposal procedures, or as prescribed by LSC policy or law.

All of LSC's books, records, accounts, and financial statements must be maintained in reasonable detail, must accurately and appropriately reflect LSC's transactions, and must conform both to applicable legal requirements and to LSC's system of internal controls. It is a violation of this Code to prepare records or reports that are intentionally misleading. It is also a violation of this Code to intentionally omit or delete essential information from any record or report.

Directors, officers, and employees of LSC should exercise prudence in formulating the communications they make while transacting LSC business. They should take care to use appropriate language and behave professionally when communicating with others in connection with the transaction of LSC business, including but not limited to their communications via e-mail.

Whenever it appears that records may be required in connection with a pending or reasonably anticipated lawsuit or government investigation, all potentially relevant records in electronic and hardcopy form must be preserved and retained, and ordinary disposal or alteration of any records pertaining to the subject(s) of the pending or reasonably anticipated lawsuit or investigation must be immediately suspended. If an individual is uncertain as to whether certain records under his or her control should be preserved because they may relate to a pending or reasonably anticipated lawsuit or investigation, he or she should preserve such records and contact LSC's Office of Legal Affairs for further guidance and direction.

IX. Protection of Corporate Assets

Directors, officers, and employees have a continuing obligation to protect and conserve all corporate money, property, and other resources, expending them strictly in accordance with LSC policies and procedures. For further information, please refer to Section 5.3 of the LSC Employee Handbook.

X. Audits and Financial Statements

LSC's Directors, officers, and employees will be responsive and accessible to auditors and will not in any way limit the scope of the auditors' work or restrict their access to LSC records or personnel.

LSC's Directors and officers are responsible for the design and implementation of policies and processes to promote full, fair, accurate, timely, and understandable disclosure of LSC finances in public reports.

LSC's officers and the Inspector General are responsible for reporting to the Board of Directors any significant disagreements between the LSC financial staff and the auditors with respect to accounting principles, methods, or practices, whether or not subsequently resolved.

XI. Fair Employment

LSC is committed to fair employment practices, including the prohibition of all forms of illegal discrimination. All employment decisions will be based on business reasons such as qualifications, skills, and achievements, and will be made in compliance with all applicable employment laws. For further information, see LSC's Equal Employment Opportunity Policy in Section 2.1 of the LSC Employee Handbook.

XII. Nonretaliation

LSC prohibits retaliation against officers or employees of LSC who report in good faith instances of apparent misconduct or violations of any law, regulation, or LSC policy, or this Code or who cooperate or participate as a witness in the investigation of a complaint about a violation of this code.

XIII. Discrimination and Harassment

At no time should any Director, officer, or employee subject a colleague to any form of discrimination, harassment or intimidation, including abusive, harassing, or offensive conduct, whether verbal, physical, or visual.. This includes anything that constitutes or contributes to a hostile work environment, as described in the LSC Employee Handbook. Threats or acts of violence or physical intimidation are strictly prohibited. Directors, officers, and employees are encouraged to make known to the offending person any conduct that makes them uncomfortable. Officers and employees have a duty to report immediately discrimination, harassment or threatening behavior to the Director of Human Resources or the Chief Administrative Officer when they become aware of it. Directors have a duty to report such behavior to the Ethics Officer.

For further information on reporting offensive conduct or to review the official policy prohibiting harassment, including the complaint procedure in its entirety, see LSC's Policy Prohibiting Harassment, Including But Not Limited to Sexual Harassment, which may be found in Section 2.3 of the LSC Employee Handbook.

XIV. Reporting and Resolving Violations

LSC's Directors, officers, and employees have a duty to report any reasonable suspicion of a violation of any law, regulation, or LSC policy, or this Code, or any reasonable suspicion of waste, fraud, abuse, or material mismanagement, to the Ethics Officer, the Office of Inspector General, or other appropriate personnel, in accordance with procedures contained in this Code or in the LSC Employee Handbook, Section 2. Anonymous reports will be accepted. The appropriate office of LSC, including the Office of Inspector General where appropriate, will promptly investigate any matter so reported. Confidentiality will be respected to the extent possible. LSC encourages its employees to talk with their supervisors, office directors, the Ethics Officer, or the Inspector General when in doubt about the best course of action to take in a particular situation.

The OIG will be informed of reported matters that involve violations of laws, rules, or regulations; mismanagement; gross waste of funds; abuse of authority; a substantial danger to the public health and safety; or other serious wrongdoing, whether by the reporting employee or the recipient of the report, so that it can determine whether an OIG investigation is warranted. In the absence of special or unusual circumstances, the following do not constitute the type of matters about which the OIG must be informed: minor or technical irregularities that occur on a non-recurring basis and involve neither abuse of authority nor a threat to the integrity of LSC programs or operations, and employment-related complaints and grievances that can be handled through regular complaint and appeal procedures.

Directors, officers, and employees of LSC are expected to cooperate in the internal investigation of allegations of misconduct or violation of any law, regulation, or LSC policy, or this Code. Where appropriate, LSC may take disciplinary and/or corrective action, up to and including termination of employment, for the commission of any violation of this Code or for the failure to cooperate in an internal investigation.

If the Board of Directors concludes that a Director has knowingly violated any law, regulation, or LSC policy, or this Code, it may impose such disciplinary measures as are appropriate and permissible under the circumstances, including censure and, if warranted and permitted by law, removal of the Director from the Board.

By signing this document, the undersigned understands and acknowledges receipt of a copy of the LSC Code of Ethics and Conduct and agrees to abide by it.

Print Name:

Signature Date

Mr. FRELINGHUYSEN. I am on your side, but I think these are the sort of questions that certainly are within the purview of our Committee.

Ms. BARNETT. Absolutely.

Mr. FRELINGHUYSEN. If there are some doubts about what you are doing, and I have no doubt about the mission of the Legal Services Corporation, certainly from the New Jersey experience, it would be good to address them head on. This is a pretty good venue to give us some pretty good assurances. So I think you have done that, Madam President.

Mr. STRICKLAND. I will say Mr. Frelinghuysen that having worked with this Board for five years I am absolutely convinced that every member of the Board is dedicated to what they are doing. And they demonstrate that every time I have the occasion to work directly with them at Board meetings and otherwise. And there has never been any doubt of that.

Mr. FRELINGHUYSEN. I am sure it is true dedication, but the GAO has found some weaknesses and obviously even despite that dedication there have been some identifiable weaknesses and I think we have a right to sort of——

Mr. STRICKLAND. I agree with you completely.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Thank you. Mr. Fattah.

Mr. FATTAH. I just really want to complement what you have done by responding to the concerns that have been raised. Obviously, this is a very important agency to Philadelphia that has a done a great deal of service for thousands of my constituents.

So, Mr. Chairman, I yield for any other questions at this time.

OVERSIGHT

Mr. MOLLOHAN. Well, I am impressed after reviews by the IG last year and by the GAO last year and this year that LSC is first of all being responsive to the governance issues raised by both of these entities, leaning really forward and reorganizing in such a way as that you are going to have better oversight.

And I look at these issues that have been raised as being solvable by reorganizations and better communication with your grantees as to what is expected from them in their annual audits. Whatever weaknesses occurred in the internal controls over the grants management and oversight, it seems that you have taken immediate action. That is all to your credit, and is not at all surprising.

I am comforted by the fact that in all that oversight I don't see any bombshells here. So it sounds like you are, number one, being responsive and number two, being responsive.

FUNDING LEVEL

Mr. MOLLOHAN. Now, you are requesting $471.4 million and that is $121 million over the current year funding level. In my first round I tried to get some sense of what would be the comparable dollars today if you were being funded at the 1995 level. And you are estimating you are going to supply for the record a better number it would be over $700 million. You aren't nearly approaching the real number that you had back then and therefore you are not able to provide the services at the same level you were previously. Thus, the gap that we talk about.

And I would like to give you an opportunity to talk about the gap to give the Committee an appreciation for what you are trying to say about it and how it translates into the needs of the country with regard to providing legal services for those who can't provide them for themselves.

Ms. BARNETT. The Justice Gap Report which was the first nationwide study as to eligible people who come to LSC funded offices throughout the country indicated how many were helped and how many we were not able to help. And as a result of surveying all of our programs it was uniformly reported that for every one person that was eligible and did receive service, we were unable to serve one because of lack of program resources.

So we were meeting less than 50 percent of the need. Since the Justice Gap Report came out, there have been at least ten State legal need studies and reports that have documented far greater needs and indicate that our report understated the actual need, ranging anywhere up as high as 80 to 85 percent not being met. In addition——

Mr. MOLLOHAN. Good point.

Ms. BARNETT. Yes.

UNMET NEEDS

Mr. MOLLOHAN. You measured unmet need by the percentage of people who came into your office that you had to turn away. How is this unmet need that you didn't identify, how is that being measured?

Ms. BARNETT. With the State studies?

Mr. MOLLOHAN. Yes.

Ms. BARNETT. Each State study did it in a different way. Some were engaged academics. Some had consultants. I think in our written testimony we indicate and give the cites to all the State recent need studies. I would be happy to elaborate further on the way in which they use them. They were published reports by different entities in the States that document the needs as being far greater than the 50 percent that we documented by the request we made of our programs during a two month period in 2005.

NUMBER OF CLIENTS SERVED

Mr. MOLLOHAN. Are you able to relate the appropriations that you have received in the past and the number of clients that you have served compared to how many clients you could serve if you were to receive your request?

And maybe you can do it for the record if you can't do it here today.

[The information follows:]

LSC grantees have been closing nearly a million a cases a year collectively. In 2006, with an appropriations of $326.5 million ($4.5 million less than previous year), LSC-funded programs closed a total of 895,000 cases. In 2007, LSC received its first funding increase of $22 million, for a total appropriation of $348.5 million. LSC-funded programs closed an additional 11,000 cases than the previous year. While that number is substantial, since it was the first funding increase in four years, infrastructure and salary improvements are also being addressed. We would expect any funding increase in the future to result in an increase at least commensurate with the 2007 increase.

Ms. BARNETT. I would be happy to elaborate for the record. I can share with you that in 2007 when we got a $22 million increase in our funding we were able to close 11,000 additional cases and they are eligible cases regardless of the source of funding.

Now that is a substantial number, but it would have been even more but for the fact it was the first federal increase we have had in four years. And our programs have infrastructure needs, their operating costs have gone up. They have salary needs. As you know, legal aid lawyers are the lowest paid lawyers in the public sector.

And so in spite of that I would indicate that we would be able to increase the number of cases commensurate with the increase we did with the 2007 increase. But closed cases are not the sole measure of the services that Legal Services programs perform. They do an extensive array of non-case work that is preventative. They do community legal education. They do legal brochures. They do pro se assistance. They do self help materials.

And in fact last year we handled 500,000 or close to somewhere between 500,000 and a million more of these additional services which would bring that up to 16,000 people being helped by them.

Mr. MOLLOHAN. Well if you were here asking for an appropriation that would close the gap as you defined it, what amount would you be asking for a federal appropriation?

Ms. BARNETT. Our Justice Gap Report said we needed a doubling of both the federal and the non-federal sources to close the justice gap at that time. And I think our Board recognizing political realities decided that they would ask for a 20 percent increase of basic field grant over five years.

Well, clearly, we are not going to close the gap in five years. But that was the principled approach in trying to ask for an appropriation that would eventually help close the justice gap.

But the justice gap is in fact a moving target. And it has increased by the needs of the sub prime loan mortgage crisis. And it has increased by the needs of victims from natural disasters. So in one point of time when we said what was the justice gap, the justice gap keeps increasing as the economy and these different disasters of one kind or another increase the number of poor people who are in need of and are eligible for free legal services.

And today there are 50 million people that would qualify for eligibility for civil legal assistance.

TURNING AWAY CLIENTS

Mr. MOLLOHAN. Okay. So it is your testimony that for one of the one out of two people that you have to turn away that walk in your office and ask for help, that the person you have to turn away or that 50 percent, they would otherwise be eligible except you just do not have the capacity to provide service to them?

Ms. BARNETT. That is correct.

Mr. MOLLOHAN. They are turned away because you don't have enough resources to provide service to them. Otherwise, they are eligible. They are not excluded by any of the restrictions and——

Ms. BARNETT. That is correct. They are turned away solely because our programs don't have the resources to be able to assist them.

Mr. MOLLOHAN. Well that must be difficult to turn these people away. Do you simply turn them away? Do you refer them to other resources? You put them on a waiting list? How do you deal with the people you turn away?

Ms. BARNETT. Well as I indicated in my oral testimony, I found that to be the hardest part of the job of being a legal aid lawyer, because when you turn them away many, many if not most times there is nowhere else to go.

Mr. MOLLOHAN. Really? You don't have any place to refer them to?

Ms. BARNETT. I don't.

Mr. MOLLOHAN. You are often just saying, "Sorry, we can't help you."

Ms. BARNETT. That is right.

Mr. MOLLOHAN. Wow.

Ms. BARNETT. That is why we are increasing the amount of work we do for self help material and community legal education to know your rights to try to empower people to help themselves when we are not able to help them ourselves.

Mr. MOLLOHAN. Are you developing strategies for these alternative ways to assist people?

Ms. BARNETT. Oh, we are doing that through our technology grants. We are doing that through the other services that we provide. We are trying to better capture those services from our programs in order that we can be able to have available to people we are not able to provide legal representation the means by which they can help themselves.

Mr. MOLLOHAN. Mr. Fattah.

Mr. FATTAH. On the Chairman's——

Mr. MOLLOHAN. You will just yield to——

RESTRICTIONS

Mr. FATTAH. On the Chairman's line of questioning, some of these people you are turning away as individuals could be assisted if you were able to proceed and focus on groups of individuals, class action and other types of more broad-based strategies and there are restrictions now, right, on what you can and can't do in that regard.

Could you talk about how that impacts your work, you know, for instance on the foreclosure crisis that the nation is facing now. I would imagine that thousands and thousands of families who have been victimized to predatory lending or the like, you know, could conceivably be helped through aggressive legal work, but there are restrictions on how far you can go now in terms of working with groups or classes of individual Americans, right?

Ms. BARNETT. That is correct. The Corporation believes that it is our duty and obligation to see that the will of Congress is followed. And as long as the restrictions are a part of our appropriations we vigorously enforce them and support them through our regulations.

In fact, there are two cases pending. I can't talk about the substance of the cases, but I can just report on the status, one in Oregon and one in New York where we are vigorously defending the regulations. The Oregon case was brought in 2005 and motions for summary judgement were argued February 8 and a court decision is awaited. In New York the case was filed in, I believe, 2001. It has gone all the way up to the Supreme Court who denied cert and it is now back in the Eastern district of New York waiting for the judge's decision applying the appropriate standard that was determined by the Second Circuit.

So there is litigation on these matters. We are defending them and we await the court's decision. And of course we look to enforce the will of Congress in this area.

Mr. FATTAH. Let me yield to the Ranking Member. Are you going to go vote?

Mr. FRELINGHUYSEN. I have voted.

Mr. FATTAH. Oh, you have. The floor is yours.

GAO REPORT

Mr. FRELINGHUYSEN [presiding]. I thank the gentleman for yielding. I just wanted to get a little bit of clarification since Mr. Strickland made the centerpiece of his testimony, you know, a reaction to the GAO reports. I just want to understand here.

The GAO actually made recommendations to Congress about possibly making changes in law about your governance. And I think we discussed in my office that there might be some potential down sides. So I would just like to know does the Legal Services Corporation think, that is necessary, or are things should we say on the road to fiscal stability and accountability such that maybe Congress doesn't need to open this issue?

Ms. BARNETT. If I could respond, Congressman Frelinghuysen. There was one recommendation by GAO to Congress that you have rightly referred to. And I think it is the Corporation's view at this point having been looked at extensively by the Office of Inspector General, having being looked at extensively by GAO with regard to our governance and accountability, having been looked at extensively by GAO as to our relationship with our grantees and our oversight, that we have been looked at from top to bottom, inside and out. And I think we have come out of it stronger and I do not believe that the Corporation feels there is any further need to do that.

And I guess we would agree with the wisdom of Congress when they established the Corporation as an independent corporation and kept it somewhat free from political decisions in its operations.

NEW INSPECTOR GENERAL

Mr. FRELINGHUYSEN. You have a new Inspector General who was introduced. Are you reviewing these cases maybe through your President and Chairman?

Just for the record, if you would just identify yourself for the transcriber.

Mr. SCHANZ. Yes. Jeffrey E. Schanz. Last name S C H A N Z. I was selected as the Inspector General for Legal Services Corporation on March 3 of this year. I bring a lot of energy and experience to the position. And I plan on conducting both internal of the Corporation and external reviews, audits and investigations of the 137 grantees and corporate governance.

Mr. FRELINGHUYSEN. Well God speed to you. [Laughter.]

ALLEGED INAPPROPRIATE EXPENDITURES

The alleged inappropriate expenditures, I assume there is going to be a report coming at some point in time?

Mr. SCHANZ. Correct. We have already visited three of the eight sites. We have teams out at the other sites and including Chicago and Casper, Wyoming. And I am used to traveling so I believe my staff will be traveling.

Mr. FRELINGHUYSEN. Okay. You have three offices that deal in some ways with grants oversight unless there have been any more created, let me know. The Office of Program Performance, the Office of Compliance and Enforcement, and the Office of the IG, Inspector General.

You both testified that the responsibilities of these offices are under review, but can you describe in general the differences in the roles of these three entities?

Ms. BARNETT. Well, I will start with explaining our Office of Program Performance, which really looks to ensure that the service delivery system that is being provided is of high quality and efficient and effective, meeting the legal needs of the service area. And their guiding principle is our revised performance criteria. And it is based on the criteria which reflects LSC's sense of current best practices to ensure high quality legal services, that they do office visits, they do their reports based on that. We do the competitive grants process based on the performance criteria.

Our Office of Compliance and enforcement looks to ensure that our programs comply with LSC regulations, rules and the LSC Act. And they go out and also make program visits. They look at such things as the intake and case management system to see that the clients are financially eligible, to see that the clients are citizens or lawful aliens. To see that the cases are within program priorities. To see that there are retainer agreements.

They look to see that the programs comply with our case service reporting system. They look to see that their PAI is done in conformity with both fiscal and programmatic needs. They look at limited fiscal areas at this point. They look at timekeeping. They look to see if there are fee generating cases. But they don't look more broadly. It is a very limited fiscal component.

And then, of course, they look to see that the activities don't violate the regulations. So they look at the cases and pleadings to see there are no class actions, there are no attorneys fee cases, there are no solicitations. In addition, they give prior approvals as required for any expenditure over $10,000. And all the programs have to report to LSC on either an annual basis or a semi-annual basis regarding many of their activities.

So those are basically the oversight functions of the Office of Program Performance and the Office of Compliance and Enforcement.

Mr. FRELINGHUYSEN. You don't anticipate any reorganization or consolidation of any of those areas?

Ms. BARNETT. I don't anticipate reorganization and consolidation. What I do anticipate and what we are clearly working on the sharing of information, better coordination not only between our two offices, but the Office of the Inspector General as well, and the clarification of the roles. So I don't anticipate an actual restructuring, but I see a much closer relationship. I see a much closer sharing of information and coordination so that we all know what the other one is doing to ensure the best oversight we can provide.

Mr. FRELINGHUYSEN. I think Mr. Schanz is showing his eagerness to make sure that all of those oversight responsibilities allow us to draw as much information from them as possible.

Your testimony mentions, we touched on this earlier, that you are reviewing your oversight of the IPA process, the Independent Public Accountant process. Correct me if I am wrong, this is the process whereby each grantee has an annual independent audit. What improvements do you have in mind for this process and how proactive are you in reaching out to grantees and their IPAs to comply with the underlying new procedures?

Ms. BARNETT. Well, I think as I indicated, the IPAs are supervised by the Office of the Inspector General. And we are working with that Office together to try to come up with some guidance. For instance, guidance that when IPAs go to a program and they ask if the program does entertaining, they look to the expenses to see whether or not perhaps alcohol was mischarged to LSC funds.

Mr. FRELINGHUYSEN. Thank you for your response. I have to vote. [Laughter.]

FUNDING LEVEL

Mr. MOLLOHAN [presiding]. The Bush Administration has requested $311 million for fiscal year 2009 which is $40 million below the current year's funding level. Aren't you glad you don't have to go through them?

What would be the effect of this cut on the clients served by LSC grants?

Ms. BARNETT. Three hundred and eleven million dollar budget would be close to a $40 million cut or a 13 percent decrease, not counting the four percent of inflation. It would be devastating on our programs, offices would have to close, staff would have to be laid off. But the most significant would be fewer deserving low income persons who require legal assistance to keep a roof over their head or to get out of a battered relationship or to get necessary health care or to protect elderly who are subject to predatory lending would not be able to be assisted.

Mr. MOLLOHAN. You know information that I am supplied and I ask you to verify this is that if the Committee were to adopt the President's request, again which is $40 million below the current year's funding level, that Legal Aid of West Virginia would be cut by $315,000 below its current funding level of $2.8 million. And by contrast the Legal Service Corporation's 2009 request of $471 million would provide an additional million dollars for West Virginia.

Are you prepared to verify numbers?

Ms. BARNETT. I believe they would have less than $350,000——

Mr. MOLLOHAN. Uh huh.

Ms. BARNETT [continuing]. Under the President's budget.

Mr. MOLLOHAN. What did I say?

Ms. BARNETT. Three fifteen.

Mr. MOLLOHAN. Three fifteen. Thank you.

Ms. BARNETT. Right. Yes, we would be happy to verify that.

[The information follows:]

At the request of Chairman Mollohan, I want to confirm that that the President's funding request of $311 million for LSC could cut the funding level for the Legal Aid of West Virginia (LAWV) by more than $350,000. The program's current budget is $2.8 million. With LSC's FY 2009 budget request of $471 million, LAWV would receive a total of $3.8 million or $1 million increase, funds that are desperately needed to provide legal assistance.

MORTGAGE FORECLOSURES

Mr. MOLLOHAN. Okay. Great. Thank you. How has the wave of mortgage foreclosures across the country affected demand on LSC services? And you touched on this a bit, but if you could elaborate.

Ms. BARNETT. The sub prime mortgages are disproportionately, I think, impacting low income renters and elderly on fixed incomes. And the sub prime loans are recent phenomena, that they are tainted with fraud and other unlawful acts, and I think we believe this requires legal representation in order to preserve the homes.

The programs, we don't have national statistics, but we are hearing from programs. Some programs are getting four or five calls a day. Some programs are doubling the amount of requests that they have had. There is no question that programs have set up special projects to try to deal with the increased demand.

These loans have been targeted for low income and minority communities. And they prey on the elderly and the uninformed and those with limited English proficiency. And we are just getting case by case stories, actually that at least the provision of legal aid has helped them negotiate the terms of their loan, challenge their notice in court, challenge the underlying proceeding in court and preserve the homes for these people.

But without additional resources I don't believe that our programs will be able to meet this increased demand.

Mr. MOLLOHAN. Uh huh. LSC's Loan Repayment Assistance Program, will you tell us what that is?

Ms. BARNETT. We are in the third year, we were appropriated one million dollars to operate a Loan Repayment Assistance Program. We began initially by reaching out to our programs that had particular difficulty in recruiting and retaining attorneys. And in our first year I think we had 71 attorneys both who we recruited and retained. We paid $5,000 for each of three years.

Our preliminary assessment and evaluation of the first year clearly demonstrated that this Loan Repayment Assistance Program, even as small as it was, was making a meaningful difference to young lawyers who graduate with over $80,000 worth of debt and have an average starting salary of $37,000 but want to do public service and legal aid work were able to come to the programs and it was able to keep experienced staff that were already in the programs.

So it not only helped the young attorneys for joining the programs, it enhanced the ability of the programs to be able to recruit and retain staff. This year we raised the amount to $5,600 and we have 58 participants. We are very pleased that the Higher Education Act of 2007 included a provision for loan repayment for legal aid lawyers, but we believe until it gets funded and implemented, it is more than a year away. We have asked for additional funding to increase the pool so then when we report back to Congress, finally we have a larger pool to be able to make the case that this has not only helped attorneys come to legal aid and stay at legal aid, it has helped the programs be able to recruit well qualified and experienced attorneys.

Mr. MOLLOHAN. Is the need for this program geographically uniform across the nation or are there areas that it is more effective in helping to recruit?

Ms. BARNETT. Perhaps in major metropolitan areas it is not as needed. We did not choose those as much as some of the rural areas where it is more difficult to get attorneys. But we have a broad spectrum of programs participating in the——

Mr. MOLLOHAN. So you are implementing this program selectively——

Ms. BARNETT. Yes. We——

RECRUITING LAWYERS

Mr. MOLLOHAN [continuing]. In areas where you are having more difficulty recruiting lawyers?

Ms. BARNETT. We asked our programs to submit to us the reasons why they were having difficulty in recruiting and retaining. And we made a judgment. And we looked at geographic balance and we looked for larger programs and small programs and rural programs and urban programs so that we would have a mix to be able to report back to Congress. And I think we do have a mix of programs, but it was based on their response to us of their difficulty in being able to recruit and retain attorneys.

Mr. MOLLOHAN. And you are suggesting that the program has been effective? Has it been in effect, has it been implemented long enough for you to make a determination about its real effectiveness?

Ms. BARNETT. Well we have evaluated its first year. We are in the process of completing the evaluation in the second year. I don't think any of the results are surprising to any of us. That it helps the attorneys make this decision. It helps the programs. And without this, even though people want to do this kind of work, they would not be able otherwise to come. Whether they will stay when the loan repayment is over and they say they don't know whether they will be able to, even though that is their what they want to do and they are satisfied with their job.

So——

Mr. MOLLOHAN. You mean stay——

Ms. BARNETT. In legal aid.

Mr. MOLLOHAN [continuing]. Past the point that they are receiving this loan repayment supplement——

Ms. BARNETT. Right.

Mr. MOLLOHAN [continuing]. Which is three years.

Ms. BARNETT. Right.

Mr. MOLLOHAN. My information is that the average law school debt is over $80,000. Three years of $5,000 or $5,600, I mean during that three year period, I suppose, it is a way to pay it, but it is you know, on an $80,000 average debt it doesn't really make a dent on the overall debt, but I suppose it helps the lawyer repay it during the year that they are working for legal aid.

Ms. BARNETT. That is correct, Mr. Chairman. It is not a lot, but it certainly helps them while they are repaying it. And that is part of the reason we are asking for this additional one million dollars to continue it. We certainly would like to continue it until a federal program comes into effect. And we would like to have a larger pool so that when we come back next year with our evaluation you would find it meaningful.

Mr. MOLLOHAN. Be able to assess it at that time.

Ms. BARNETT. Yes.

Mr. MOLLOHAN. Mr. Fattah.

Mr. FATTAH. No, I am done.

Mr. MOLLOHAN. You are done. Mr. Frelinghuysen.

FORECLOSURES

Mr. FRELINGHUYSEN. Just back onto the foreclosure issue. I assume you gave us some anecdotes. You did give us some statistics. I assume you are going to keep a pretty close eye on this, pulling as much information as possible.

Ms. BARNETT. We certainly are. And I can even share with you that we added two new case categories to our case service report so that if we come back next year we would be able to have a better idea of the actual numbers for you.

Mr. FRELINGHUYSEN. This obviously requires the local legal services group to, you know, do pretty much of a balancing act, I assume?

Ms. BARNETT. It would require the local programs, of course, to identify this as a program priority.

Mr. FRELINGHUYSEN. Yes.

Ms. BARNETT. Because it is up, as you know, to the local programs to——

Mr. FRELINGHUYSEN. So more of one might mean less potential support for what Legal Services Corporation does traditionally?

Ms. BARNETT. And that would be left up to the programs.

Mr. FRELINGHUYSEN. I think we are becoming a little more expert on this issue of sub primes. It certainly is in nobody's interest to promote foreclosures, but needless to say there is somebody out there filling that gap and it really is outrageous that there are people taking advantage of people to expedite their losing. I mean it really is outrageous. There is a website mentioned in the New York Times the other day which I thought was even more appalling. It is called walkaway.com. I mean it was front page New York Times.

Just a couple of other questions relative to compensation rates above statutory caps. Last year, as you are aware, we carried a provision that gave you the authority to pay employees in 2008 at a rate above the statutory caps. Can you describe why this is necessary and how many employees have been affected?

Ms. BARNETT. This has to do with the locality pay.

Mr. FRELINGHUYSEN. Yes.

Ms. BARNETT. All right. And we had been paying locality pay above the statutory cap. And we had asked Congress to continue to permit us to do that and I believe it affected only 17 employees;

11 in management and administration and six in the Office of the Inspector General.

Mr. FRELINGHUYSEN. We carried that provision at your request.

Ms. BARNETT. Yes.

Mr. FRELINGHUYSEN. So I assume you are familiar with it. Of course, the President's budget proposes to eliminate it. So I guess my bottom line question is are you going to ask the Committee to carry the same waiver language for fiscal year 2009?

Ms. BARNETT. Yes, we are, Congressman Frelinghuysen.

Mr. FRELINGHUYSEN. Okay. Thank you, Mr. Chairman.

PRIVATE SECTOR LAWYERS

Mr. MOLLOHAN. Okay. You require your programs to promote private sector lawyer participation providing legal services. Tell us how you do that. Give us an idea how many clients that allows you to serve.

Ms. BARNETT. I would be happy to. We require our programs to expend the equivalent of 12.5 percent of their basic field grant on private attorney involvement in their service delivery.

This means that they are spending it to do training and recruiting of volunteers, the oversight of the cases, whatever——

Mr. MOLLOHAN. Training and recruiting of private sector lawyers?

Ms. BARNETT. Right. To do pro bono work.

Mr. MOLLOHAN. Do you pay private sector lawyers to do——

Ms. BARNETT. The vast majority——

Mr. MOLLOHAN [continuing]. But wouldn't be doing pro bono, but to represent.

Ms. BARNETT. The vast majority of the private attorneys that work with our programs do it pro bono for no cost. We do have some Judicare or reduced fee attorneys in certain areas of the country where it is difficult to find private attorneys to do pro bono work. However, we had over 97,000 cases closed by private attorneys in 2007 with over 31,000 attorneys helping our programs. We have made it a major initiative to increase the private attorney involvement with our programs.

Mr. MOLLOHAN. Pro bono?

Ms. BARNETT. Pro bono involvement.

Mr. MOLLOHAN. Under what circumstances would you hire a private attorney?

Ms. BARNETT. Well we don't hire these attorneys.

Mr. MOLLOHAN. No, I know the pro bono ones you don't, but I understood your testimony to be in some certain circumstances you might pay on a lower scale——

Ms. BARNETT. Yes.

Mr. MOLLOHAN [continuing]. A private attorney to undertake a case.

Ms. BARNETT. I can think of——

Mr. MOLLOHAN. You are looking for a specialty or are you looking——

Ms. BARNETT. No. I am thinking of Wisconsin Judicare in areas where there aren't many private attorneys. We would pay a very much reduced rate for us to be able to send cases to this panel that would handle the cases on a very reduced fee. But the vast majority of private attorneys that work with our programs and handle these 97,000 cases are pro bono. And actually our Board initiated a private attorney involvement plan called "Help Close the Justice Gap. Unleash the Power of Pro Bono."

And they adopted a resolution encouraging programs to enhance their private attorney involvement. And we asked all our programs to adopt similar resolutions. And to date we have more than 80 programs that have already adopted it.

In addition, I sent a program letter out in December of 2007 encouraging our programs to look at creative, strategic, innovative ways to use private attorneys. And citing examples that many of our programs have used so that other programs could think to replicate them. And private attorneys do direct representation of clients. Private attorneys co-counsel and support cases with them. Private attorneys do transactional work, they do training in their areas of specialty. They have on occasion helped draft manuals for the use of our attorneys. So there is a wide range of services that private attorneys provide to LSC eligible clients.

Mr. MOLLOHAN. Okay. Thank you. Mr. Strickland, you are probably sitting there feeling neglected. [Laughter.]

Mr. STRICKLAND. Oh, that is all right. I don't mind it a bit. This is a tough, tough crowd here. [Laughter.]

Mr. MOLLOHAN. You were really busy at the beginning talking about all these GAO studies and reports. I want to give you an opportunity.

JUSTICE GAP STUDY

Mr. STRICKLAND. I wanted to make a couple of points, if I may, Mr. Chairman, to quantify when you were talking a moment ago about one out of two eligible clients being turned away. In the year of the Justice Gap study, those numbers were that our grantee programs combined with pro bono lawyers had represented a million eligible clients and it follows that they turned away a million.

I remember reading the draft report before it was published and that number just jumped off the page. And as President Barnett said that probably has gotten worse. And particularly as we do these State legal need studies, I think we are going to find that it is worse than that.

And I also wanted to emphasize that included in the legal work that was done for those clients was this private attorney involvement. So even with that, there was still this tremendous unmet legal need.

Mr. MOLLOHAN. And that can all be translated into the human consequence of that.

Mr. STRICKLAND. Absolutely.

Mr. MOLLOHAN. I am sure that translates into battered women, maybe people killed.

In any reports you submit or communications with us, if you can translate the consequences in those terms, that is always a good thing to know.

Mr. STRICKLAND. And in terms of being able to refer those individuals elsewhere they really have come to the court of last resort, so to speak, when they have come to——

Mr. MOLLOHAN. And they are desperate.

Mr. STRICKLAND [continuing]. To legal aid. Absolutely.

Mr. MOLLOHAN. Obviously, they are desperate. They probably wouldn't know where to go if——

Mr. STRICKLAND. Where they think they should go, of course, is to legal aid. And unfortunately as we have observed today that half of them are being turned away. And we are speaking of income eligible clients, not undocumented immigrants or folks in that category, but eligible clients.

Mr. MOLLOHAN. Well that is a serious issue. Mr. Frelinghuysen.

NEW TECHNOLOGY

Mr. FRELINGHUYSEN. Just about everybody who comes before the Committee is talking about utilizing new technology. You have a technology initiative. Do you want to roll it out for us? I think you are doubling the amount of money and is it exciting or how would you characterize it? What are you doing to promote inner connectivity and give your people the tools you need to communicate with one another around the country. Tell us about it.

Ms. BARNETT. We, with Congressional appropriations, began our technology initiative grants program in 2000. And through 2007 we have made grants totaling $27 million. And the results of that have been enhanced and more efficient and more services. Through that funding we have funded centralized intake systems, which gives clients easier access to our services.

We have funded Statewide websites in every State that give a full range of information. We have funded the automated document assembly where people who are unable to get representation can fill out court forms, online that have been drafted with court input that are accepted in the courts in multiple languages. Maybe in 35 different languages we have done that.

So we have, I think, enhanced pro se assistance, enhanced access to our programs. We have improved technology infrastructure in our programs. We have this year funded an 800 number for low wage workers to be able to claim the earned income tax credit. And in 2007 alone we have returned over $10 million to low wage earners because of that.

We are looking at other ways that 800 numbers can be used by low income people throughout the country. We are looking at the possibility of online intake where 24/7 through the internet people could access our services that would be then integrated into their case management system. We don't even know what the use of cell phones may be in the next couple of years as a means of communicating.

So I think our technology initiative and the funding we get from Congress for technology we have used to both expand our services, increase them, improve the efficiency of our programs and we look forward to continued funding to be able to report to you the new advances that——

Mr. FRELINGHUYSEN. Well we commend you for your efforts. As you know, I am housed in my New Jersey Office cheek by jaw with one of your legal aid, Morris County Legal Aid Society. And of course, you know, it is the same old, same old in terms of the people who do a remarkable job for, I mean earning nothing. You know, I don't think they get any pension benefits at all. I mean they do some incredible work. I always hope that some day maybe they might be slightly compensated by some technology that would enable them to do an even better job with the resources they get.

So thank you, Mr. Chairman.

Mr. MOLLOHAN. Now there is a good opportunity to input a program with a member of Congress. [Laughter.]

Right next door to him. Mr. Fattah.

Mr. FATTAH. I will yield, Mr. Chairman.

Mr. MOLLOHAN. Okay.

Mr. FATTAH. I think we have gotten to the point.

ADVERTISEMENT

Mr. MOLLOHAN. Just following up a little bit as a final question. I have seen advertisements, not for legal services because they are not provided by lawyers, but by corporations online for leases, deeds and wills. The organization may be run by lawyers, but they specifically disclaim giving legal advice.

Are you familiar with such services? And if so, can you automate your services in that sort of way? You are unfamiliar with them?

Ms. BARNETT. I am not familiar with them. In some ways I wonder whether there is any unauthorized practice of law implications, but——

Mr. MOLLOHAN. Well I know that immediately occurred to me, but I am advised there is not and I have not looked into specifically, but there were corporations that provide, it is threatening isn't it?

Mr. STRICKLAND. It is threatening. [Laughter.]

We do have on, correct me if I am wrong on this, but I believe we have on some of our websites that is websites maintained by our grantee programs, some standardized pleadings. For example, for a domestic relations case where an indigent client could capture those pleadings and fill in the blanks and at least file the case in the correct form so that it comes before the court in good order as opposed to something just their own attempt to do that.

So I think we have in effect gone into that business to some extent, that is providing a standard form pleading, in a domestic case is one that I can think of right now.

Ms. BARNETT. I will just supplement that, if I might. One of the grants that I thought was terrific that we did with our TIG funding was in Idaho where we had the approval of the courts to adopt Statewide forms. And believe it or not somebody could fill the form out in Spanish and it would come out absolutely properly formatted in English.

So we are using technology in that way.

Mr. MOLLOHAN. I will find out more about this and follow up.

Ms. BARNETT. We would be happy to answer. And if you have a question on it and specifically.

Mr. MOLLOHAN. Well if there are no more questions, Chairman Strickland, President Barnett, we very much appreciate all the good work you do on behalf of providing legal services to those who can't afford it. And we appreciate your testimony here today. And know that you are going to continue to aggressively follow up on all those oversight issues.

Mr. STRICKLAND. Thank you very much, Mr. Chairman.

Ms. BARNETT. Thank you.

Mr. MOLLOHAN. Thank you.

[Questions and answers submitted for the record follow:]

Questions for the Record – Legal Services Corporation
Submitted by Chairman Alan B. Mollohan

LSC Response—May 6, 2008

FY 2009 Budget Request

For FY 2009, the Legal Services Corporation requests $471.4 million, a $121 million increase (34%) over the current year funding level? What is the rationale for such a large increase?

Response: We are aware that our 2009 request is significantly higher than our 2008 funding level; however, we believe that it is the Legal Services Corporation's responsibility to inform the Congress of the unmet need for civil legal services in America. As our Justice Gap Report documents, 50 percent of the people who ask for assistance and are eligible to receive it, are turned away due to the lack of adequate resources. Last year, LSC grantees closed 906,507 cases, but because they are only able to provide services to half of the people who seek assistance, at least as many also were turned away. Since the release of the Justice Gap Report, other state legal needs studies and reports have not only affirmed the findings but found that the unmet need for civil legal assistance is actually higher, ranging from 66 percent in California to 87 percent in Utah. In addition, programs are experiencing an alarming increase in the demand for services due to the foreclosure crisis and impact of natural disasters. Without a major increase in funding, LSC grantees will not be able to meet the increased demand for services.

LSC's FY 2009 request represents a 20 percent increase in Basic Field Grants which conforms to the Board's original plan to close the justice gap in five years. The amount of the increase was calculated against the FY 2008 Senate-passed total for Basic Field Grants of $371 million. This is the same methodology used over the last two years, continuing the approach initiated in 2006. While the last two years have demonstrated that it will be more than a 5-year process to close the justice gap, progress towards that goal is essential.

How many clients will be served with the $350.5 million appropriated in FY 2008? How many more people can be served if LSC receives its $471 million request for next year?

Response: The number of clients served with the FY 2008 appropriations will not be available until March of 2009. LSC's appropriation of $350.5 million in 2008 represents a one-half of one percent, or less than $2 million, increase from the previous year. The distribution of $2 million among our 137 grantees is a very slight increase from the previous year and therefore will likely not result in a significant increase in the number of people served. The $22 million increase we received in 2007 enabled our grantees to close 11,000 more cases than the previous year. While that number is substantial, it would be even higher had it not been the first federal funding increase in four years, and it was critical that infrastructure and salary improvements were initiated by our programs. We would expect any funding increases in the future to result in an increase in cases at least commensurate with the 2007 increase.

However, the number of cases closed is not the sole measure. Our programs also provide a wide variety of other services to help prevent legal problems from occurring and to assist eligible clients with self-help solutions. These services include community education workshops, legal education brochures, and both websites and courthouse kiosks that provide information, downloadable forms and other self-help materials. Final totals show 16.6 million other services provided in 2007, an increase of 1.35 million services over 2006.

In 1995, LSC was funded at $400 million. What are the comparable dollars today of that funding level?

Response: To get $400 million in 1995 purchasing power, LSC would need $555.6 million in 2008 dollars. Our request for FY 2009 for $471 million does not even come close to our funding level in 1995 adjusted for inflation dollars. In addition, if LSC funding had kept pace with inflation on our FY 1980 funding level of $300 million, our funding level today would be $770.7 million.

Given that LSC programs don't have enough resources to serve all eligible clients, are certain types of cases given priority over others?

Response: LSC grantees are independent non-profit 501(c)(3) organizations with their own Boards of Directors who set the program's priorities based on the needs of the poverty population in their geographic location. Nationally, LSC grantees provide a wide range of civil legal services to their clients; however, the majority of the cases involve family law (38%), housing (25%) and income maintenance (12%) matters. With family law representing the largest category of cases handled, it is not surprising that three out of four, or 74 percent, of the clients served are women, many of whom are mothers struggling to keep their children safe and their families together.

How do LSC-funded programs deal with those whom they are unable to serve due to limited resources? Are they put on a waiting list? Are they referred elsewhere?

Response: In very few instances do LSC-funded programs create waiting lists given the time-sensitive nature of most civil legal matters. Instead they rely on a combination of referrals to state bar associations, court-sponsored *pro se* programs, and LSC self-help tools, and legal rights publications. However, at the end of the day we know for a fact that many remain underserved or completely unserved.

Mortgage Foreclosure Crisis

How has the wave of mortgage foreclosures across the country affected demand for LSC services?

Response: With record level increases in the rate of foreclosures across the country, more and more low-income Americans facing foreclosures or evictions are turning to legal services programs for legal assistance. Many of our programs across the country are seeing a dramatic increase in calls from eligible people seeking assistance with housing and predatory lending matters. In particular, LSC-funded programs are helping seniors with fixed incomes who are particularly vulnerable to predatory lending and renters who are facing evictions from properties in foreclosure sales.

While the foreclosure crisis is far too fresh to have allowed us to compile nationwide statistics, other national studies have found a high percentage of subprime mortgages in high-poverty areas. In West Virginia, for example, 37 percent of all mortgages are subprime in the ten poorest counties, well above the statewide average of 12 percent. Increased access to legal aid is a necessary part of an overall defense against foreclosure.

We know from many years of experience that the true underlying danger of the foreclosure crisis is the spiraling set of effects that loss of a home can have on a family. Medical and mental health issues, domestic problems and spousal abuse, neglect of children, and loss of income are all additional crises for the family and burdens on the system that result from homelessness.

What kinds of services are the LSC grantees able to provide to clients in these circumstances?

Response: LSC-funded programs have provided assistance to victims of housing mortgage scams or unscrupulous lending practices for years, but the number of foreclosure-related cases handled by our programs is increasing. Many of our programs have established special projects specifically dedicated to addressing foreclosure-related cases in areas with high foreclosure rates, such as Maryland, North Carolina and New York. Overall, housing related matters represent 25 percent of the cases closed by LSC-funded programs, second only to family law cases. Without additional funding, these programs will be unable to meet the increasing demand for legal assistance related to foreclosures and evictions.

LSC grantees provide a wide range of services to people with foreclosure problems. For example, legal services attorneys help clients preserve their housing by:

- Negotiating with lenders when appropriate;
- Filing injunctions in state court;
- Filing exception proceedings in state court after a sale;

- Filing Chapter 13 Bankruptcy to stop an imminent sale;
- Referring clients with potentially fee generating predatory lending cases to the private bar.

Loan Repayment Assistance Program (LRAP)

The LSC's Loan Repayment Assistance Program is now in its third year. How has it affected the ability of LSC programs to recruit and retain legal aid attorneys?

Response: LSC's pilot LRAP is designed to assess the extent to which loan repayment assistance enhances the ability of LSC grantees to recruit and retain high-quality staff. Our initial program provided each participant up to $5,000 each year for three years, for a total of $15,000 in loan repayment assistance. Now, the program provides up to $5,600 for three years. The average starting salary for a legal aid attorney at an LSC-funded program is $37,000 and the average law school debt is more than $80,000. In order to attract young lawyers to legal services programs, higher salaries and debt repayment programs are essential.

Our first year evaluation of our pilot program found that loan repayment assistance substantially enhances attorneys' ability to work in legal services and enhances programs' ability to recruit and retain staff. Participants in the LSC pilot program report that the loan repayment assistance significantly increased the likelihood that they would stay with their program.

An additional $1 million will allow LSC to extend its three-year pilot program and create a larger pool to further demonstrate the impact on the ability of LSC-funded programs to recruit and retain attorneys. While Congress has included a loan repayment assistance provision in the Higher Education Act of 2007 to be administered by the Department of Education, that program will require more than a year to be funded and implemented, necessitating the continuation of our pilot at least through 2009.

How many new legal aid attorneys have been brought on board so far through this program? How many more can be recruited with the $1 million requested in FY 2009?

Response: A total of 82 attorneys from 24 LSC-funded programs have been participants in the LRAP Pilot and of those, 29 have been new recruits. Given the fact that retention of trained attorneys is an equal or greater problem than recruitment, LRAP has been shown to be an effective tool to meet both challenges. Given our current guidelines of $5,600 per year for a maximum of three years, $1 million dollars would enable us to assist 59 additional attorneys with loan repayment.

Restricted Grantees – Client Access to Services

In recent years, some legal aid programs have been restricted or suspended for violating federal laws or rules on the use of federal funds. How are eligible legal aid clients served in areas where programs are restricted or de-funded?

Response: The LSC Act provides general enforcement authority to the Corporation. To ensure compliance with federal law and regulations, LSC uses a variety of enforcement tools, formal and informal, such as:

- Corrective action plans (CAP)
- Special grant conditions
- Questioned cost proceedings
- Month to month funding
- Temporary suspension of funding
- Termination of a recipient's grant

The vast majority of LSC grantees are in compliance with federal law and regulations. However, LSC has taken corrective action against programs with occasional instances of non-compliance such as disallowing inappropriate costs charged to a recipient's LSC funds, imposing special grant conditions designed to prevent a repeat of a violation, suspending funding for up to a month, and imposing month-to-month funding. In recent years, LSC has terminated only one LSC-funded program. The legal services program in American Samoa's funding was entirely terminated due to serious non-compliance issues. Through the competitive process LSC is advertising for a new provider.

In the rare cases when LSC is forced to temporarily suspend or terminate a grantee's funding, the Corporation attempts to find other organizations, groups, or individuals in the community that can fill the void. LSC-funded programs as part of the statewide justice systems help to ensure that poor Americans have access to civil legal services. This includes both LSC and in some cases non-LSC legal services programs.

Are there other barriers that prevent states or regions of the country from providing legal aid services to eligible clients? If so, what are you doing to address them?

Response: LSC grantees provide legal services in every city, county, state, and territory in the country. Certain regions do pose unique challenges to effectively providing legal assistance to the poor. Grantee staff in rural areas, for example, often travel great distances to meet with clients, collaborate with colleagues in other offices, or attend court hearings. LSC's Technology Initiative Grant (TIG) program has funded video-conferencing systems that allow grantee staff to more easily connect with clients, and with each other. Additionally, the TIG-funded network of statewide legal assistance websites also allows clients in remote areas to access valuable free legal information and resources from their home computer or local library.

Certain grantees also face fundraising challenges in areas with less economic resources, requiring them to depend almost entirely on their LSC grant to operate. For example, in 2007, LSC funding for the Legal Services of Alabama represented 87 percent of their total funding sources, while only 18 percent of the Maryland Legal Aid Bureau budget is made up of LSC funding. We encourage all grantees to leverage limited resources by partnering and collaborating with other supporters of civil legal aid, including state and local governments, the private bar, philanthropic foundations, and the business community.

Locality Pay

The Legal Services Corporation requests the continuation of a "locality pay" provision to pay employees in 2009 at a rate above the statutory caps. Please explain why this is necessary and how many employees will be affected.

Response:

LSC provides locality pay to its employees according to a policy adopted by the Board of Directors in 1999. LSC's locality pay program is based on the federal locality pay description, authorized by 5 USC Sec. 5304 and regulations adopted pursuant thereto, 5 CFR Sec. 531.601 *et seq.* LSC considers the percentage of locality pay permitted by the federal government to Washington, DC-based federal employees as a guide but has continued to pay for a rate lower than the federal government's.

A technical issue was raised in 2006 as part of the OIG's *Report on Certain Financial Practices at the Legal Services Corporation*, concerning the Corporation's locality pay system. When locality pay is combined with base pay, the locality pay system takes the compensation of LSC officers, including the President, the Inspector General, Officers and some senior staff above the pay cap specified in the LSC Act. A total of 16 people are affected, 10 from Management and 6 in the Office of Inspector General. Last year, the Corporation, with the support of the Office of the Inspector General, requested bill language to allow the LSC locality pay system to continue. No additional funding was necessary for this change. Congress agreed by adding bill and report language permitting the locality pay system to continue at the Corporation in the FY 2008 omnibus appropriations bill.

While the ultimate solution is a reexamination of the statute that imposes a salary cap of Executive Level V and consideration of changing to a more appropriate rate for the Corporation, the Corporation will again seek language in the FY 2009 appropriations bill to continue the program. Without the locality pay program, the Corporation's ability to recruit and retain qualified people at comparable salaries for the Washington DC metropolitan area is severely weakened.

Questions for the Record – Legal Services Corporation (LSC)
Submitted by Rep. Rodney P. Frelinghuysen

LSC Response – May 6, 2008

GAO Reports

1. **Your budget request for Management and Administration is an increase of $4.5 million or 36%. Would that increase all go to increased grantee oversight as recommended by GAO? How many additional staff would that support, and in which offices?**

Response:

In light of recent GAO recommendations to strengthen and update LSC's oversight of its 137 grantees, additional resources are necessary to expand LSC's oversight of grantee compliance with regulations and congressional restrictions and to help enhance the quality of grantee services.

Currently, our budget of $14.5 million ($12.5 million appropriation plus interest and carryover funds) for M&A supports a total of 88 people at the Corporation, approximately half of whom (41 people) are responsible for oversight of the grantees. Presently, the Corporation has 16 staff members in the Office of Compliance and Enforcement and 25 staff members in Office of Program Performance. Of the requested increase, the Corporation will hire an additional eight compliance staff, four program staff, and four office support staff. In addition to hiring additional oversight staff, the Corporation will add additional contractors to assist with on-site program visits, will meet inflation demands in office operational costs, and will adjust for the reduced interest and carry forward funds expected in FY 2009.

TUESDAY, FEBRUARY 26, 2008.

INTERNATIONAL TRADE COMMISSION

WITNESS

DANIEL R. PEARSON, CHAIRMAN

OPENING REMARKS

Mr. MOLLOHAN. We will come to order.

Welcome to members, staff, agency witnesses, as well as the public.

This afternoon we welcome the Honorable Daniel Pearson, Chairman of the International Trade Commission, to testify on the challenges facing the Commission as it carries out its critical trade functions in fiscal year 2009 and the budget proposed to meet those challenges. The budget request of the Commission is $73.6 million.

Before inviting you to make an opening statement, Mr. Chairman, I recognize my ranking member, Mr. Frelinghuysen, for any opening comments.

Mr. FRELINGHUYSEN. It is a pleasure to welcome Chairman Pearson.

I echo the Chairman's comments. We look forward to hearing about some of the challenges you are facing that are reflected in your budget materials and in your statement.

Thank you very much, Mr. Chairman.

Mr. MOLLOHAN. Your written statement will be made a part of the record, and we invite you to summarize it as you see fit.

Mr. PEARSON. I was hoping you would allow me to deviate from the prepared script.

Let me begin by thanking the subcommittee, both for the opportunity to testify and for managing to grant our full fiscal year 2008 appropriation request of $68.4 million. And I will explain a little later why that has been so useful.

I am pleased to have both Vice Chairman Aranoff and Steve McLaughlin, our Director of Administration, here. They will answer all of the hard questions.

What is the same as last year for us? Our budget allocation is about the same, in terms of how we split the pool of funds. Salaries and benefits account for about 71 percent of our total expenditures. Rent accounts for 12 percent. It is a little bit up from last year, and I will explain that in a bit. Services are around 11 percent. Those are our security guards, some of our IT support, people with whom we contract for necessary services. That leaves us with 6 percent for other that is somewhat discretionary—travel and training and miscellaneous.

Another thing that is the same as last year is we are still digging out of the situation we got ourselves into by asking for a reduction of $2.75 million in our fiscal year 2006 appropriation, which then gave us a low baseline for the modified freeze in 2007. We have made good progress now with the 2008 appropriation, but we still have effects from that earlier situation.

And the final thing that is the same is we still have no control over our workload. We deal with what comes in the door.

So what has changed since last year? We managed a cash flow under the modified freeze by allowing our vacancy rate to rise. As of the end of this week, it will be at 16 percent. Normally we have had about a 5 percent vacancy rate, so we are at roughly three times the normal level. We have 64 vacancies currently, out of a total of 407 positions. The number of ITC civil service staff is now at its lowest level since sometime prior to 1980, and we didn't have time to go back and check the archives, but it is been several decades.

Another thing that has changed, our workload has gone up. We have become entirely too popular. Last year we talked about the filing of new antidumping/countervailing duty cases going down. We were in a 3-year downtrend; knew it would likely turn at some point; couldn't predict when.

Two things have happened since then. One is that the Department of Commerce made a decision to allow the filing of countervailing duty cases against nonmarket economies, including China, and that has encouraged several filings. And then, in addition, the economy has weakened, and as we see demand for some products start to soften, then there is no longer room in the marketplace comfortably for both domestic production and imported products. So we see an increased filing because of financial pressure on domestic producers.

Now, the vacancy rates for the people who do those anti dumping/countervailing duty investigations had been allowed to rise. I mean, that was a logical thing for us to do to manage the cash flow. But we are in a situation now where we really do need to rebuild that staff.

Another thing that is different than last year—well, then I told you our 337 intellectual property investigations, that those were going up, but we were hoping they were plateauing. Well, they have continued to go up. So they didn't stop. Last year when we spoke, we had about 40 active investigations; now we are at 50, so with a 25 percent increase.

We have an office in the ITC, our Office of Unfair Import Investigations, which serves the public interest in these intellectual property cases. And they have a lot of contact with the Trade Bar. They discuss petitions that are coming up and that sort of thing. The head of the Office of Unfair Import Investigations advises that there is just no slowdown in new filings. The cases are out there, just over the horizon. We don't know exactly when they will be coming; they will be coming.

We have already had 24 new filings this fiscal year. In order to deal with that, we spoke last year about trying to hire a fifth administrative law judge. Well, we had that effort under way, but then we had two of our then-sitting judges retire. So we went from four judges down to two. We have managed to hire two back or, you know, two replacements. And so we are still at four ALJs. We are in the process of trying to hire the fifth now. The application deadline closes here in a few days, and we will, I hope in March, be able to interview some candidates.

What we have been able to do is to hire more staff for the ALJs, more clerks. We have also added resources to the Office of Unfair Import Investigations and to the general counsel's office. And when I say "add resources," I mean adding basically patent attorneys.

One other thing that doesn't really come under the purview of appropriations, but we are seeking legislative relief regarding the hiring of Section 337 judges because of problems we have with the existing alternatives.

Another thing that has changed since last year, we have more requests for Section 332 investigations on trade issues. These are the economic analyses, the reports that we are asked to prepare, either by the Ways and Means and Finance Committees here on the Hill or by USTR.

As examples, we are doing more support for USTR in the Doha round. We have a very interesting but complicated request from Chairman Rangel for a three-part study on China, trying to understand the policies that China has that influence international trade. The first of those studies is completed. The second one is under way, and the third one will end sometime late next year.

But they are very resource-intensive. They take a lot of time. We have challenges obtaining data from the Chinese. Some travel is required. So these are very interesting and worthwhile, but they have required more resources than we anticipated.

The staff who work on those tend to be the same staff who would be available otherwise to work on the antidumping/countervailing duty cases. We have a fair amount of synergy between some of our offices that work on slightly related items, and so we are seeing a pinch both ways there.

With all this focus on staff shortages, it probably won't surprise you to learn that I have developed a reputation as being fairly good at saying no. We haven't had any money. I can assure you, though, that my happiest day as Chairman came this past December when, after learning that we had been granted our full $68.4 million appropriation request, I sat down at the desk and signed a stack of Form 52s to allow some hiring, which—it was a wonderful thing.

Let me say a good word about the senior managers in the Commission. They all knew the budget situation that we were in. And I wouldn't say there was no complaining or anything, but they pretty well tightened their belts and—and with the light at the end of the tunnel, they found a way to get things done. But when we could authorize some new hiring, it was great for me and for the full Commission.

So we now are trying to fill 25 of the 64 open slots. If we can get those key positions filled, then we will be able to move on to do the others. It is our plan to try to get down to a 9 percent vacancy rate by the end of fiscal year 2008. And then the hope is that we could continue that rebuilding process and get it down to a 7 percent vacancy rate by the end of 2009.

Another thing that has changed since last year is our rent. And I talked last year about the rent. It was our projection, based on what the GSA had told us, that we would be looking at a 15 percent increase. In August, less than a week before we were expected to sign a letter of agreement, they advised us that, “Oops, well, sorry, it is 38 percent, $1.3 million.”

Of course our appropriation request was in long before that, and we have had no alternative other than to absorb the $1.3 million, which we are doing basically by delaying some IT-related projects and some FISMA-related items. There are certain things that we would prefer not to delay, but we are not taking it out of personnel. We are sticking with our personnel plan for fiscal year 2008. But in fiscal year 2009 we just, out of necessity, have to build in an extra $1.3 million that we hadn’t thought we were going to ask for, as part of our ongoing funding requirement.

So what is not included in our 2009 request? Well, we have not included a sixth administrative law judge. We have had some discussion as a Commission. We may need to take that step sometime in the future. We don’t think we are quite there yet. We want to get five ALJs up and running and see how that goes, let that consolidate a little bit, and then make a call on whether to hire a sixth.

The judges are telling us that they really need another courtroom. We have two courtrooms that are devoted to the 337 cases, and that worked okay when we had a lower caseload. What we are having as a problem now is that we have the guidance in the statute to try to finish these cases in 12 to 18 months. And partly because the caseload is heavy in and of itself and partly because soon after the case is filed the judge will schedule a time when a hearing room is open to hold the hearing, and with hearing rooms being booked, they are having to schedule those out further—so many of our cases now are being scheduled for well over 20 months’ completion times, and the intellectual property holders are not amused.

Another thing that is not included in this request is some larger IT expenditures, IT infrastructure issues. We are not so far away from having to come forward, I think, with a more significant IT request, that would go beyond basic replacement.

And then we continue to be behind in our continuity-of-operations planning. We have done some planning work, but we have not been in a financial situation where we have been able to actually locate a site, an off-site site, to relocate to and to go through any type of actual drill for continuity of operations.

Another thing that is not in the budget is preparation for what I might call the coming wave of retirements. Twenty percent of ITC staff currently are eligible for retirement. Within 5 years, another 19 percent will be eligible. And that, of course, is on top of the current 16 percent vacancy rate. So you can understand our interest in trying to bring in some younger staff to work with the older folks, try to get the benefit of that expertise before they leave us.

So this last part has been by way of early warning. Don’t be surprised if we talk to you about some of these again next year.

Let me comment briefly on the risks that I see of an appropriations freeze in 2009. We don’t know if it will happen, and I understand it is beyond the control of anyone here, but we have had to think about that as we, you know, get ready for what lies ahead.

Even a partial freeze would derail our 2-year plan for rebuilding staff. If we have to pause in our recruitment efforts, it would mean that we would miss the January hiring cycle for economists. We are several Ph.D.s short now, and this year we have been in the market, trying to hire some. We have been turned down by three so far. We are doing our best. I have approved waivers to grant some extra preferences, and we hope to be able to hire someone, but it has been a little dicier than I would have liked. But if we miss them this year, then we need all the more to be able to hire some of those folks next year.

A complete appropriations freeze would have the effect of reducing our personnel compensation by $3.6 million relative to what we are now planning for fiscal year 2009. And to fill that gap would require either an immediate reduction in force of 7 percent of our staff or, over the course of the year, allowing the staffing to fall enough so that we would have an average vacancy rate of 16 percent. And if we follow the average approach, by the end of the year, as a practical matter, we would be somewhere around 56 people short, on top of the vacancy rate that we started with at the first of October, this coming. So we would be really in a world of hurt.

And the other risk if there is a real constraint on appropriations next year is equipment upgrade, especially in the IT area.

Conclusion—I am getting to the end here.

I would like to express appreciation for the work of your staff, Mr. Chairman and Mr. Ranking Member. Tracey LaTurner, Adrienne Simonson, Sally Moorhead, Mike Ringler, Katie Haslet, they have really been exceptional to work with. And I say that because we are a small agency and, in the broad scheme of things, not terribly important, and yet your staff has treated us as if we are real people. And that is very gratifying.

Mr. FRELINGHUYSEN. Fantastic.

Mr. PEARSON. But, no, I have just had the impression, our concerns, even though they are modest in the broad scheme of things, are being taken seriously. And so that makes us feel wanted.

My 2-year term, Mr. Chairman, will end this coming June, and I will be pleased to hand over those administrative responsibilities to one of my highly qualified Democratic colleagues. Don't know who at this point, but I have my hopes. I sincerely hope that the new Chairman will be able to continue the process of rebuilding the Commission's staff and its broader capabilities.

And to that end, it would be very helpful if we are able to receive the full $73.6 million appropriation that we are requesting, which has the bipartisan and unanimous support of the Commission. I recognize that is a 7.6 percent increase. It is significant in percentage terms. And I would be pleased to discuss in more detail why we think it is necessary.

Thank you very much.

[Testimony of Daniel R. Pearson, Chairman, United States International Trade Commission]

STATEMENT OF THE HONORABLE DANIEL R. PEARSON, CHAIRMAN, UNITED STATES INTERNATIONAL TRADE COMMISSION, BEFORE THE HOUSE COMMITTEE ON APPROPRIATIONS SUBCOMMITTEE ON COMMERCE, JUSTICE, SCIENCE, AND RELATED AGENCIES

February 26, 2008

Introduction

Mr. Chairman and members of the Subcommittee, I am pleased to have this opportunity to discuss the appropriation request of the United States International Trade Commission for fiscal year (FY) 2009. I am accompanied by Vice Chairman Shara Aranoff, and Stephen McLaughlin (the Director of Administration and CIO).

Before turning to the specifics of our request, I would like to thank this Committee for its support of the Commission's mission and budget requests over the years. That support has been constant and bipartisan and is greatly appreciated. Reflecting that spirit, the Commission's appropriation request has been developed in a non-partisan manner, with input and agreement from all Commissioners. The request is fiscally responsible, but also provides the resources necessary to accomplish our mission in the face of a substantial increase in workload.

Mission and Function

The U.S. International Trade Commission is an independent, quasi–judicial federal agency with broad responsibilities on matters of trade. In Import Injury Investigations, we investigate the effects of dumped and subsidized imports on domestic industries and conduct global safeguard investigations. In Intellectual Property-Based Import Investigations, we adjudicate cases involving imported goods that allegedly infringe intellectual property rights, primarily patents. Through such proceedings, the Commission facilitates a rules–based international trading system. The Commission also serves as a federal resource where trade data and other trade policy–related information are gathered and analyzed. The information and analysis are provided to the President, the Office of the United States Trade Representative

(USTR), and Congress. The Commission makes most of its information and analysis available to the public to promote understanding of international trade issues.

The mission of the Commission is to: (1) administer U.S. trade remedy laws within its mandate in a fair and objective manner; (2) provide the President, USTR, and Congress with independent, quality analysis, information, and support on matters of tariffs and international trade and competitiveness; and (3) maintain the Harmonized Tariff Schedule of the United States (HTS). In so doing, the Commission serves the public by implementing U.S. law and contributing to the development of sound and informed U.S. trade policy.

The USITC FY 2009 Appropriation Request

The Commission seeks an appropriation of $73,600,000 for FY 2009. This represents a 7.6 percent increase over our FY 2008 appropriation request. This may seem like a substantial increase. However, it is warranted in light of the Commission's unique circumstances.

The Commission is governed by statutes allowing it to carry forward any budget surplus from one fiscal year to the next. In May 2005, the Commission correctly anticipated a substantial surplus for FY 2005, as a result of several unforeseen and non-recurring cost reductions. The Commission therefore made the somewhat unusual decision to write the House and Senate Appropriations Committees requesting that its appropriation for FY 2006 be lowered by $2.750 million, dropping its request from $65.278 million to $62.528 million. Congress responded by providing an FY 2006 appropriation, net of rescissions, of $61.951 million. That amount, combined with the Commission's FY 2005 carryover, was sufficient to fund operations in FY 2006.

The Commission's actions in 2005 were reasonable and responsible. However, the reduced FY 2006 appropriation left the Commission with an artificially low baseline to which the FY 2007 spending freeze was applied. Funds available to the Commission in FY 2007 were $1.327 million lower than in FY 2006 and $1.382 million less than our FY 2007 request.

Coping with the Hard Freeze

Salaries and benefits together typically account for more than 70 percent of the Commission's expenditures. Rent accounts for over 10 percent. The Commission had few options in coping with the financial restraints imposed by the year-long CR in FY 2007. The Commission filled very few personnel vacancies as they arose. By the end of FY 2007, the Commission's vacancy rate was at 14 percent, and it remains at that level today. Such a high vacancy rate is unsustainable in light of the Commission's rising workload and its need for staff with highly specialized skills. A year with such extensive vacancies has reduced the depth of the Commission's technical and analytical expertise and imposed considerable strain on the remaining people. The Commission has begun efforts to address these personnel gaps, but it is unlikely to be able to meet all of its recruiting needs in FY 2008 alone.

Even though the vacancy rate was allowed to rise to 14 percent in FY 2007, personnel costs nonetheless increased, given government-wide salary increases and the need to hire some highly compensated individuals to work on our growing caseload of intellectual property investigations. Increases in some other expenses were also unavoidable. Actual reductions in expenditures on items other than personnel, benefits, and rent were necessary given the reduction in available funds. In FY 2007, the Commission's non-personnel/non-rent expenditures were $10.4 million, down from $13.5 million in FY 2006, a decline of nearly 23 percent. The Commission's FY 2009 request budgets $12.6 million for such expenditures, a significant increase over FY 2007 and FY 2008, but still well below FY 2006 levels. Full funding in FY 2009 is essential so that the Commission may undertake maintenance and replacement activities postponed in FY 2007 and to mitigate the risk of damage and disruption in service to customers that would occur upon significant equipment failure.

Increases in the Intellectual Property Workload

The Commission's intellectual property workload consists primarily of investigations under section 337 of the Tariff Act that involve allegations of imported products that infringe U.S. intellectual property rights. Cases are first heard by a Commission administrative law judge (ALJ), and the Commission then adopts, modifies, or remands the ALJ's determination.

The Commission's intellectual property workload has expanded dramatically in recent years, tripling since FY 2000. The workload remained at high levels in 2007 and has increased significantly in FY 2008, with 15 new complaints filed in the first quarter of FY 2008 alone. This increase in workload may be attributable to a greater appreciation for the value of intellectual property by its owners. I like to think the workload increase is also a reflection of respect for the level of expertise of the Commission's ALJs. The Commission's ALJs are unique within the federal government for their exclusive focus on IP issues. The Commission is also justly appreciated for the high caliber of its Office of Unfair Import Investigations, which represents the public interest in section 337 investigations, and for the ability to complete IP investigations expeditiously—generally within 18 months of filing.

The rapid increase in the section 337 workload has put a serious strain on the Commission. The Commission has also experienced difficulty in hiring and retaining ALJs. The Commission determined in FY 2007 to add a fifth ALJ position to its staffing plan in response to the growing workload. However, two ALJs retired during FY 2007, and by the end of FY 2007 the Commission still had only four ALJs on staff, despite successfully recruiting two new ALJs. The Commission is currently attempting to recruit a fifth ALJ. But the applicant pools have declined significantly in recent years, and the Commission remains concerned about its ability to find highly qualified candidates under the current recruitment and hiring constraints imposed by the Office of Personnel Management (OPM). The current workload levels mean that a newly recruited ALJ will be handed at least half a dozen investigations immediately upon arrival at the Commission, with little time to learn IP caselaw. The Commission may need statutory or regulatory relief from the OPM system in order to recruit judges with specialized backgrounds, especially as rising workloads and possible retirements may require multiple additional recruitments over the next few years.

The rising IP docket may force further additional expenses on the Commission in the near future. The addition of a fifth ALJ should lessen the heavy workload currently placed on the agency's ALJs and help the Commission to meet its goal of swiftly resolving these disputes. However, the presence of a fifth ALJ may place a greater strain on the Commission's physical resources. Our building currently has two courtrooms available for the use of its ALJs. These courtrooms are solidly booked well into the future. The Commission may need to seek additional courtroom space so that litigants in our forum can gain the full advantage of having a fifth ALJ. We continue to assess the need for additional courtroom space, but have not included a funding request for that purpose in FY 2009. The Commission also may need to hire additional support staff for the ALJs, as well as increasing staffing for both the Office of Unfair Import Investigations and the Office of the General Counsel.

Increases in the Import Injury Caseload

Filings of new import injury, or title VII, investigations slowed somewhat in recent years. In the second half of FY 2007, however, filings increased significantly. The recent spate of new filings seems to be related, to some extent, to the U.S. Department of Commerce's recent decision to apply the countervailing duty (CVD) law to China. Six new CVD investigations were filed against products from China in the second half of FY 2007 and two thus far in FY 2008. Furthermore, the title VII caseload tends to be counter-cyclical, with filings increasing during economic downturns. Thus, we are projecting that title VII filings will remain at relatively high levels in FY 2008 and FY 2009.

The Commission has been successful in shifting some resources from the Office of Economics and the Office of Industries to assist the Office of Investigations to meet periodic increases in the import injury caseload, as economists and international trade analysts work in both areas. However, these shifts are only feasible when one operation is slowing. Our recent experience has been an increase in both Import Injury and Industry and Economic Analysis areas, at a time when our vacancy rates have been extremely high. We must fill at least some of the positions that were allowed to remain vacant throughout FY 2007 to maintain the high quality work product, of which we are understandably proud.

Significant Increases in GSA Rent Charges

The Commission has occupied space at 500 E St. SW since the building was opened in 1987. The Commission's second 10-year occupancy agreement (OA) expired in August 2007. During the early stages of our budget formulation process for FY 2008, in spring 2006, the Commission began to seek information from GSA regarding the likely increase in our rent. We first received an estimate from GSA in May 2006, indicating that FY 2008 rent would be approximately $7.0 million, a 15 percent increase over FY 2007. The Commission received a higher estimate later in 2006, but was then told to use the $7.0 figure. We planned our FY 2008 budget accordingly, relying on the $7.0 million estimate.

The Commission received no further information from GSA until August 2007. A week before our existing OA expired, we were informed by GSA that our actual rent increase would be closer to 40 percent than 15 percent. We had no choice but to accept the increase and sign a letter of agreement to that effect. In October 2007 we formally sought some relief from this increase from GSA. We have yet to receive a final response to that request. We must proceed in FY 2008 and FY 2009 on the presumption that the rent increases will stand. This is a heavy burden for a small agency whose expenses are concentrated in personnel costs and rent, neither of which can easily be reduced. This is especially true given that non-personnel/non-rent expenditures, which represent less than 20 percent of our FY 2008 and FY 2009 budgets, already were severely curtailed in FY 2007.

Cost Increases Outside the Control of the Commission

The Commission's budget is largely fixed for FY 2009. It comprises salaries (56.3 percent), benefits (14.9 percent), rent (11.7 percent), and required support services (11.1 percent), such as security guards and network services.

Increased costs in FY 2009 and beyond for these categories are driven by external factors over which the Commission has no control. Salaries increase based on the federal pay raise and step increases. Benefits increase with salaries, but also because of increased health insurance costs and the shift in the workforce from CSRS to FERS. [FERS employees cost the ITC 24.5 percent of salary; CSRS costs the ITC 8.65 percent of salary.] Rent increases are driven by GSA's cost of leasing our building, along with unpredictable increases in real estate taxes.

In FY 2009, we anticipate that personnel expenses will increase by $3.6 million, or 7.3 percent. This assumes that the Commission will continue to reduce its vacancy rate by filling open full-time slots, but we still are projecting a vacancy rate of 7.0 percent at the end of the fiscal year. Personnel expenses also presume a federal cost of living increase of about 3.5 percent, a conservative estimate in light of FY 2008's 4.5 percent increase. We presume an additional increase in the cost of benefits because of rising health care costs and the shift of employees into FERS. We estimate that rent will increase by about 3.0 percent in FY 2009, following the 38 percent increase in FY 2008.

Commission Workload Estimates are Reasonable, if Conservative

Regarding Commission activities, our FY 2009 budget request is premised on fairly conservative caseload estimates. We anticipate instituting 48 import injury investigations in FY 2009, similar to our estimate for total FY 2008 activity and below the high levels seen in FY 2004 and 2005. We anticipate that the substantial rate of increase in new Intellectual Property filings that has persisted for several years will stabilize, with the overall caseload remaining at historically high levels. We anticipate that the Industry and Economic Analysis caseload will increase.

Flexible Staffing Practices in Response to Variations in Commission Caseload

The Commission's staffing needs are driven by the demands of its investigative workload. Over 80 percent of the Commission's annual costs are attributed directly or indirectly to investigative activity. In recent years the Commission has successfully responded to variations in its overall caseload by temporarily reassigning its permanent staff. This strategy was particularly successful in meeting the staffing needs for antidumping/countervailing duty (AD/CVD) investigations driven by the cyclical increase in review ("sunset") investigations. To the extent possible, we will continue to meet variations in staffing needs through cross-training and reassignment. However, reassignment cannot be used to meet all variations in caseload, as investigations involving intellectual property issues, for example, require staff with specialized skills.

Litigation

At the end of FY 2007, 56 appeals involving Commission AD/CVD determinations were pending at the Court of International Trade or the Court of Appeals for the Federal Circuit. Additionally, two disputes were pending before NAFTA panels and three were pending before the WTO. Litigation in the AD/CVD area is likely to remain quite active, as parties increasingly challenge recent Commission sunset determinations and also contest determinations regarding eligibility for funds under the Continued Dumping and Subsidy Offset Acct (the "Byrd Amendment").

Similarly, litigation activity in the section 337 area has risen significantly. Between FY 1996 and FY 2002, the Commission dealt with six to eight appeals per year. In FY 2006, the

Commission dealt with 15 appeals. At the end of the first quarter in FY 2007, there were 9 section 337 appeals pending at the Court of Appeals for the Federal Circuit. At the end of the first quarter of FY 2008, there were 34. Given the rising level of overall investigative activity in this area, the Commission is likely to see further increases in litigation as well. The need for increased litigation support in the section 337 area should be met by the same staff increases referred to earlier.

Industry and Economic Analysis Investigations

FY 2007 saw a significant increase in the number of investigations instituted relative to the recent past, and we project that activity in this area in FY 2009 will be similar to that seen in FY 2007 and FY 2008. Along with an increase in the number of studies requested, complexity is rising as well. Recently requested studies are more likely to require economy-wide assessments or other highly specialized analysis. Many result in the production of national security information (NSI) classified materials, which are more costly to process.

The Offices of Economics and Industries are most involved in the production of these studies. No increase in staffing is planned to meet the increased caseload, which the Commission hopes to meet by efficient utilization of its overall staff. However, both offices are currently experiencing higher-than-average vacancy rates, and the limitations of our FY 2007 spending level postponed any attempt to fill those vacancies. Staffing levels in both of these offices will need to be improved so that the Commission can continue to supply Congress and the executive branch with timely and accurate assistance and analysis over a wide variety of topics.

Tariff Affairs and Trade Agreements

The Commission is charged with producing and maintaining the Harmonized Tariff Schedule (HTS) of the U.S. The HTS must be modified any time a free trade agreement is signed into law, an omnibus trade bill is enacted by the Congress, or the President proclaims amendments arising from the World Customs Organization. Commission staff are widely recognized for their expertise in this area.

The Commission also supplies Congress with legislative reports on proposed tariff waivers. For the 109th Congress, 1,027 bill reports were prepared by Commission staff, up from a total of only 711 for the two prior (107th and 108th) Congresses. For the 110th Congress, 807 bills have been introduced in the House alone. The Senate is expected to begin introducing bills soon.

Recent history suggests that demand for Commission assistance in this area will grow. However, the Commission has no plans at this time to seek additional staff for this function.

Conclusion

In conclusion, let me speak on behalf of all Commissioners in saying that we find our responsibilities to be both rewarding and quite challenging. One of the greatest challenges is dealing with fluctuations in workload over which we have no control. Of necessity, the appropriations process requires federal managers to project their financial requirements some two years in advance of when the final funds allocated for a given fiscal year will be expended. The Commission's workload has the potential to spike or decline much more quickly.

The appropriations request we have submitted represents the Commission's best estimate of the funds we will need to accomplish our mission in FY 2009.

Once again, Mr. Chairman, I would like to thank your subcommittee for its ongoing support of our work at the U.S International Trade Commission.

I would be pleased to answer any questions.

Mr. MOLLOHAN. Thank you, Chairman Pearson, and thank you, Vice Chairman Aranoff, for your good work on the Commission. It is certainly appreciated by everyone. And you deal with a lot of issues that I am concerned with, and really do appreciate your consideration as you consider those cases.

Administrator McLaughlin, how long have you been in this job?

Mr. MCLAUGHLIN. I have been in this job since 1995.

Mr. MOLLOHAN. You know, as you look ahead at some of the challenges you have—rent challenges, relocation challenges, staffing challenges—as the Chairman has described them, have we built into that some contingencies?

And first of all, let me, on one hand, commend you for your fiscal responsibility and for your honesty in coming forward.

But I am wondering if you anticipated some of the unintended results of, you know, no good deed goes unpunished. And looking forward, are you anticipating the unexpected here or the unintended?

And I am referring to giving back money and maybe the rent situation, not any of which is necessarily anybody's fault. But as you are looking forward, to what extent do you think you are anticipating the unexpected?

Mr. MCLAUGHLIN. I think it is fair to say that we try to balance what could happen good with what could happen bad. It is hard to fully anticipate the unanticipated, obviously.

But when we look at risk items, one of the things we certainly didn't anticipate was the kind of change in our rent. I mean, you are always concerned, when dealing with other Government agencies or contractors, that costs won't come in exactly as you projected, but the history has been that some come in lower and some come in higher. Rarely do they come in that much higher. And then, since it is a Government agency, you have really no control over what you are going to do with it.

Mr. MOLLOHAN. I am sympathetic to that, because GSA has surprised a lot of Members of Congress, certainly this Member of Congress, with some really high rent increases over the last 4, 5 or 6 years. But I am wondering, at this point, if that is to be unexpected.

Mr. MCLAUGHLIN. Fool me once. The next time—we are assigning higher-level staff to overseeing that contract. So we are going to be monitoring that very closely, certainly.

And we do have other risk factors. And, frankly, it just hasn't been prudent, given the kinds of requests that we are asking for, to also load in things on security and replacement of equipment when, obviously, we have to accomplish our mission first.

So we have seen—I am not completely comfortable, in the last 3 years, we keep deferring these kind of secondary requirements to mission accomplishment, given the budget circumstances we are in, but we, frankly, have little choice.

Mr. MOLLOHAN. Well, with your request of $73.6 million, which is a 7.6 percent increase over 2008, do you think you are anticipating being able to adequately address deferred expenses in addition to the unexpected?

Mr. MCLAUGHLIN. We have decided that we really need to move forward on the human capital and rebuilding the agency, and that is really where we are putting the bulk of our money.

There is some risk there on systems failures and things of that nature, and some of the documentation on information security. But to a large extent, we have decided it is not that we are completely vulnerable in these areas, it is just that we can do a better job of meeting OMB requirements for documentation, not that we are vulnerable.

So I am reasonably comfortable, given the budget environment, that we can get the job done if we get our request.

Mr. MOLLOHAN. In this first round, we are going to stick to 5 minutes so everybody can have a chance to ask questions. And we just got a vote.

How many votes do we have?

We have three votes. Okay. Well, we are going to try to keep rolling with this hearing.

And, Rodney, do you think you can agree with that?

Mr. FRELINGHUYSEN. Sure.

Mr. MOLLOHAN. We can keep rolling. So we will try to stay 5 minutes—we will stay 5 minutes in the first round, and then the second round we will just see how many folks are here.

Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. When the Chairman of the Ways and Means Committee asks you to do something, you do it, I take it?

Mr. PEARSON. We certainly try to.

Mr. FRELINGHUYSEN. And, obviously, whatever three targets he suggested you investigate—and you said you have completed one study—obviously that benefits the House and Senate and, generally, I assume, gets out into the public.

Mr. PEARSON. Yes, they are intended for public distribution.

Mr. FRELINGHUYSEN. But are there any other congressional directives that are in that sort of a category that we are not aware of it, or a whole slew of them? Maybe we have put a few in our own bill. Just so I understand, so the people who would be responding to Chairman Rangel, which obviously everybody would want you to do expeditiously, are taken away from their traditional role. I see a head. I sort of wonder, how is this handled?

Ms. ARANOFF. We have statutory authority under Section 332 of the Tariff Act which gives the Ways and Means and Finance Committees, as well as both houses of Congress as a whole and the President the authority to directly request these studies from us. So that is our responsibility. We have people whose primary job is to respond to those kinds of requests.

Mr. FRELINGHUYSEN. No, I am admiring of it, and we salute you for doing it. But you are obviously doing a lot of other things, as well. In the Chairman's statement, he says, and I quote—this is under the "Increases in the Import Injury Caseload" section. It says, "The recent spate of new filings seems to be related, to some extent, to the U.S. Commerce Department's recent decision to apply countervailing duty law in China. Six new CVD investigations were filed against products in China," et cetera, et cetera, et cetera.

So besides, obviously, congressional directives, you take upon yourself historic missions from the Commerce Department? Sort of explain to me how that works.

Mr. PEARSON. Right. What is going on here, the private sector, domestic industries have responded to a change in rules that Commerce has implemented. Commerce has made it, as some firms would see it, more attractive to bring countervailing duty/antidumping cases against China. And once Commerce made that decision, then we saw firms responding to that and bringing petitions forward.

So it wasn't a direct request from Commerce to us, but Commerce kind of opening the door wider to the private sector.

Mr. FRELINGHUYSEN. Educate me. Quite honestly, I have reviewed a lot of figures here. And, I think we are hugely admiring of what you do. The protection of intellectual property is incredibly important. Is a very high percentage of this related to things from China?

Mr. PEARSON. Right.

Mr. FRELINGHUYSEN. If you were to describe to a layperson, what is the caseload? Could you talk about the complexity of some of these cases? You know, historically it has been done in an 18-month period of time. Now I assume if it goes to 20 months, either because of lack of manpower—it must be somewhat related to the complexity of the cases as well.

Mr. PEARSON. Oh, yes.

Mr. FRELINGHUYSEN. So, to the layperson, how would you characterize why you are doing more? And, is it particularly related to certain countries?

Mr. PEARSON. Right. Let me split the investigations into two separate parts.

We have our intellectual property investigations that we conduct under section 337. Those are basically like court cases where a company that believes its intellectual property—usually it is patent—is being infringed by an import can bring a case to be heard by our administrative law judges that will allow us to issue an exclusion order to keep out the infringing product. Okay. Very useful to owners of intellectual property, especially in a global economy that is increasingly dependent on trade, where so much of what we consume is imported. Okay.

Set that aside. The antidumping/countervailing duty cases are different. Those are brought usually by groups of companies, a domestic industry represented by—they will put together an ad hoc coalition or some organization, and they will decide to bring an antidumping/countervailing duty petition against imports from a country or group of countries.

We find that China often is one of those countries. Somewhat more than half of our cases deal with steel products of various sorts, with which the Chairman is particularly familiar. We also deal with quite a few chemical cases, some consumer products, a few agriculture products.

And in those investigations, we don't issue an exclusion order. We would instead be blessing the antidumping duties that Commerce has agreed on. Commerce has the job of determining how big the margin of underselling is, what is the level of unfair pricing.

And that will be the dumping margin or, in the case of subsidies——

Mr. FRELINGHUYSEN. They have that responsibility. What is your responsibility on that?

Mr. PEARSON. To determine whether the domestic industry is injured.

Mr. FRELINGHUYSEN. So it is your investigations that make those determinations?

Mr. PEARSON. Right. Assuming Commerce finds the dumping, then we look at the industry to see whether they are being hurt by the unfair imports.

Mr. FRELINGHUYSEN. I am staying in the 5-minute rule. I yield back, Mr. Chairman.

Mr. MOLLOHAN. Thank you, Mr. Frelinghuysen.

Mr. Ruppersberger.

Mr. RUPPERSBERGER. First thing, I thank you for being here today.

Just quickly, I think you referred to it, to an extent, about the Department of Commerce's decision to apply the countervailing duty law to China. Specifically as it relates to steel, have you seen a change in the cases that you are hearing as it relates to steel? Is it affecting your workload? Where are we as it relates to the issue of steel on the new Commerce decision to apply the countervailing duty law to China?

Mr. PEARSON. Right. I think that we have only one steel case that has been filed since then, and that has to do with stainless steel pipe from China. The other cases all have dealt with a variety of other products.

Mr. RUPPERSBERGER. That is amazing.

Mr. PEARSON. Right. I mean, in general, the steel industry has experienced quite strong demand, and they have been doing better financially in the last 3 years, for instance, than they had been in the previous several years.

Mr. RUPPERSBERGER. So the dumping has slowed down, to an extent, their concern about the——

Mr. PEARSON. Or even if there is some modest amount of dumping, it has not been hurting the domestic industry.

Mr. RUPPERSBERGER. You mentioned in your testimony about needing another courtroom. How many administrative law judges do you have?

Mr. PEARSON. Currently we have four. We hope soon to have the fifth.

Mr. RUPPERSBERGER. Okay. And so, how many cases are they able to hear a year? Do you know?

Mr. PEARSON. We think in terms of eight cases, eight active cases, being a full workload. And we have the four of them now, each dealing with a dozen.

Mr. RUPPERSBERGER. How long are the cases in the system from the time they start, on average? A year? Half a year?

Mr. PEARSON. Eighteen months is what we are taking now, except that it is going longer than that.

Mr. RUPPERSBERGER. Will an additional judge make a difference in that?

Mr. PEARSON. We certainly think so. We think we can get it back down more to the 15-month range.

Mr. RUPPERSBERGER. Do you need that additional courtroom also to make that happen?

Mr. PEARSON. At this point, we don't think so. And the reason is that we have our main hearing room, which some of you have seen. It is not ideally set up to be a courtroom for the ALJs, but it can work as a backup.

So what we are encouraging the ALJs to do is to go and schedule three hearings at any given time. There is a reasonable chance that one or more of those cases will settle before getting to the trial. And in the case where they actually have to go forward with three cases, we will allow them the use of the commissioner's hearing room. And if we need to schedule it for a vote or something, we would just have to postpone the ALJ hearing for a day.

Mr. RUPPERSBERGER. Thank you.

Mr. MOLLOHAN. Mr. Schiff.

Mr. SCHIFF. Thank you, Mr. Chairman. I will be very brief, because we are going to have to run to vote.

I am interested particularly in the IP work that you do. I wanted to ask you a question on the patent cases. Darrell Issa and I introduced legislation to establish a pilot program in the district courts to develop experience among Federal district judges on patent cases, because of, among other things, the very high rate of reversal in the court of appeals on patent construction cases.

The ITC has had a very low rate of reversal, and I am interested to know what you attribute that to. What are you doing right, that the district courts are doing wrong? How have you managed to have a much higher sustainability in the court of appeals than your fellows in the Federal court system?

Mr. PEARSON. Would you care to respond?

Ms. ARANOFF. The main reason that we have had such a high rate of success is our level of expertise. Our administrative law judges hear nothing but intellectual property cases, and about 95 percent of them are patent cases. Even though many of our ALJs don't come to us with patent expertise, they quickly develop it. And we do have full-time staff of patent attorneys who come in with that expertise and are hired for it. As compared to district court judges, who might only hear one or two patent cases every few years.

Mr. SCHIFF. It sounds like a pretty persuasive argument for our pilot project.

Mr. MCLAUGHLIN. I would just like to add, in addition to that, the decisions of the administrative law judges are reviewed by our commissioners, and they have good advisors on their staff as well, and the general counsel has patent attorneys. So if there are some things wrong, we can fix it before it gets out of the agency.

Mr. PEARSON. Representative Schiff, if I could just explain that, of the six commissioners, I am the only one who is not an attorney. So I found it prudent at times when legal questions get asked to turn to one of my more learned colleagues. So it is not that I have no opinion, it is just that I trust Shara's more than I trust mine.

Mr. SCHIFF. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Thank you.

You talked a little bit about your 2009 funding request and how important it was to get it. What would be the effect of a 9-month CR on the Commission?

Mr. PEARSON. At the 2008 level?

Mr. MOLLOHAN. Yes, at the 2008 level.

Mr. PEARSON. It wouldn't be pretty. The problem we have is that, because we have no—we would anticipate that there would be a Federal pay raise. And that would somehow have to be absorbed. Three months into the CR, we would need to absorb the pay raise.

Are we building in 4 percent for that?

Mr. MCLAUGHLIN. Three and a half.

Mr. PEARSON. Three and a half, okay.

We will have the $1.3 million higher rent than had been projected when we got our 2007 baseline funding, so that would have to be absorbed. The only alternative that we really have, since we have—you know, we continue to push out the IT projects that can be pushed out, but we would cut staff.

I am not saying we would do this. We have no Commission consensus to do it. But as a practical matter, if we need to have a 7 percent staff reduction, the simplest way to accomplish that would be a reduction in force at the start of the fiscal year, because that would take the number down immediately and we would get the savings throughout the full year. Whereas if we don't act soon, then we will dig ourselves in the hole and have to have an even more severe reduction in personnel later in the year.

Mr. MOLLOHAN. Will you elaborate on that answer for the record, please?

Mr. PEARSON. Certainly.

Mr. MOLLOHAN. I will give you more time to think about it and actually give us an assessment of that.

Mr. MCLAUGHLIN. Mr. Chairman, you had asked previously what risks was I concerned about. Going forward, I think we are navigating between risks fairly well. The one risk that would really scare me would be the risk of a 9-month CR. Because we are putting all our money in staff, and it is hard to take money back out of staff once they are here. That is the thing. When I became Director of Administration in 1995, we were running a RIF at that time. And I would not like to have to go back to those days.

Mr. MOLLOHAN. Okay. Well, if you would submit for the record an answer to that question, in addition to your answer here.

I think I heard you say that you were hiring more clerks to support your ALJs. Is that because of your increased caseload? Is that because the clerks, you can hire the expertise without seniority considerations? Or is it both?

Mr. PEARSON. Well, both, I guess.

[The information follows:]

Assume there will be a three to six month continuing resolution (CR) for fiscal year 2009, at fiscal year 2008 funding levels. The Commission currently has a 16 percent vacancy rate, which it plans to reduce to nine percent by the end of fiscal year 2008. However, Chairman Pearson testified that a continuing resolution at fiscal year 2008 levels would force a $3.6 million personnel compensation decrease, and an immediate reduction in force (RIF) as a result. The only alternative to a RIF is to allow an average vacancy rate of 16 percent over the FY 2008 fiscal year. Can the Commission thread the needle and hire some additional staff without decreasing vacancies to the point that a CR will force a RIF? If so, will the Commission have enough staff to accomplish its mission?

Answers: Reducing personnel expenditures
If it was clear on Oct. 1, 2008 that the ITC appropriation for FY 2009 would be frozen at the FY 2008 level, the Commission would need to take steps to raise its average vacancy rate for FY 2009 to 16 percent. A direct way to reduce personnel expenditures would be to implement a RIF, which would require at least 120 days to become effective. Reductions in personnel-related expenditures would begin to be realized in February 2009. The exact size of the RIF would depend on the vacancy rate at the start of the fiscal year and the number of retirements expected to take place in the first months of FY 2009.

Rather than having certainty at the start of the fiscal year regarding the ITC funding, the Commission anticipates operating under a continuing resolution for three to six months before learning the amount of its FY 2009 appropriation. At that point, a RIF is unlikely to be an effective means of managing the ITC cash flow. The 120-day delay between when a RIF is decided and when the vacancy rate actually rises would delay the onset of savings until sometime in the summer of 2009.

A more flexible alternative for achieving personnel savings might be to implement unpaid furloughs, which potentially could be applied to all Commission employees except the administrative law judges (ALJs). A full-year freeze at the FY 2008 funding level would be expected to require somewhere between 15 and 30 days of furloughs.

Either a RIF or furloughs sufficient to address a full-year freeze would be expected to impair substantially the ITC's ability to accomplish its mission. There would be a distinct possibility that statutory deadlines for antidumping (AD) and countervailing duty (CVD) investigations would not be met. Completion of section 332 studies of trade and economic issues likely would be delayed beyond the agreed dates. Schedules for completing section 337 intellectual property investigations likely would experience significant extensions. In addition, either a RIF or furloughs would have meaningful adverse implications for staff morale and would complicate our ability to recruit new staff once funds become available.

With less than six months to go prior to the start of FY 2009, it seems reasonably likely that the Commission will not succeed in bringing its vacancy rate down to our year-end goal of 9 percent. It has proven more challenging than expected to recruit people for certain key positions. Those efforts are ongoing, but the hiring delays nonetheless probably will have the effect of holding our vacancy rate higher than planned on Oct. 1.

In other words, we may be moving in the direction of threading the needle. A three-to-six-month CR likely would be handled by curtailing hiring for several months while we await a final appropriation for FY 2009. Depending on the size of that appropriation, we may or may not have to initiate furloughs to balance the budget. Neither curtailing hiring nor implementing furloughs would be helpful developments as we strive to strengthen our human resources and accomplish our mission effectively.

The longer that a CR is in effect, the more likely it is that there will be furloughs and the more likely it is that there will be impairment of mission accomplishment. In fact, we believe that the Commission would pass from likelihood to certainty of mission impairment sometime in February. Moreover, with a 9 month CR, the impairment would not just be reflected in delays in case completion due to lack of staffing. In addition, should we encounter systems breakdowns or security problems, the agency may not have the resources needed to remedy the situation, and that also would impair mission accomplishment.

Section 337 and AD/CVD filings have grown beyond expectations since our appropriations request was prepared in September 2007. It seems likely that new case filings will continue to grow. Under those circumstances, the Commission is at some risk of not having enough staff to accomplish its mission fully under any scenario in which our FY 2009 appropriation is reduced below the requested level of $73.6 million.

Bottom line: If the Commission had known as much in September about our caseload as we know now, we would have sought an additional $1-2 million above the requested appropriation of $73.6 million.

Mr. PEARSON. It is challenging for us to hire administrative law judges. We have only two ways to do it. One is to recruit sitting administrative law judges, which all of our current judges were sitting at some other agency. Or we can go to the Office of Personnel Management and get the three most senior names off their registry. As a practical matter, we have always done both, but we have never found one of those three off of the OPM register as having a sufficiently technical background dealing with complex cases, and certainly we have never found anybody with patent law background to hire.

So what we have tended to do is hire judges from the Federal Energy Regulatory Commission or other agencies that have a history of dealing with complicated litigation of the sort that we have. And our pool of applicants has been shrinking. I don't know what we are getting now in the current go-around, but in the last—when we hired the last judge, the pool was smaller than when we had hired the previous judge, and that pool was smaller than when we had hired the previous judge.

So I don't know what is going on, but the trend is against us. Our ALJs really do work quite hard. In a sense, they might be at the pinnacle of ALJ practice in the Federal Government. Some 90 percent of all ALJs work for the Social Security Administration, and they do important work, and it is relatively shorter cases, and they can get through it quickly. A lot of our Initial Determinations that the judges put together when they decide the cases run hundreds of pages.

Mr. MOLLOHAN. Well, what I was wondering was, is that the reason you are hiring additional clerks, more clerks, for that reason?

Mr. PEARSON. Right. Apologies for not answering the question.

Mr. MOLLOHAN. No, no, no. You were answering the question.

Mr. PEARSON. Yes, what we are trying to do is augment the skills that we have there in the four ALJs by giving them everything they need. Everything they can farm out to somebody else we are trying to allow that to happen, so that they can focus on what only they can do.

Mr. MOLLOHAN. And you are having an increased caseload at the same time?

Mr. PEARSON. Oh, yes.

Mr. MOLLOHAN. So that is obviously helping with that. Is this solving your problem? Are you solving your problem through hiring these additional clerks?

Mr. PEARSON. At a minimum, it has had the effect of persuading the existing ALJs not to retire. I mean, I think we have demonstrated to them, as a Commission, that we are committed to trying to give them what they need.

Mr. MOLLOHAN. Helping them with their workload.

Mr. PEARSON. Right. We are trying to get another ALJ; while that can't be done, what else can we do for you? And we have been doing all those things that we can.

Mr. MOLLOHAN. And with all that, you feel you need one more ALJ?

Mr. PEARSON. Yes. Soon.

Mr. MOLLOHAN. And that would solve your problem?

Mr. PEARSON. That addresses the problem for now. At the 50-active-cases level, I think we would be okay with five judges.

Mr. MOLLOHAN. I guess when I say solve your problem, does that dispose of your cases in a timely manner? Do you project that another ALJ and complement of clerks would resolve your cases in a timely manner?

Mr. PEARSON. Another ALJ with clerks, yes, that should get us, I think, back to at least an 18-month figure.

Mr. MOLLOHAN. Is that acceptable? I mean, are you asking here in your request for what you need in this area, I guess is my question? And this gives you an opportunity to speak to that, you know. Do you need more ALJs? What is your——

Mr. PEARSON. If our caseload continues to increase in the coming year the way it has in the past, someone from the Commission will sit in front of you next year and say we need a sixth ALJ. That is my personal view; that is not a Commission decision yet. But there is just no way around it. We have the tide flowing in and rising to higher and higher levels.

Mr. MOLLOHAN. Mr. McLaughlin, do you have a comment on that?

Mr. MCLAUGHLIN. When we were here last year asking for the fifth ALJ that we still don't have, it was based on 40 active cases, and the model was about eight active cases per judge. We are now at 50. We are still asking for five, but that is because we don't know that it is going to stay at 50 over the long term and we are trying to be prudent. But if it is at 50 next year, I think you could anticipate additional upward pressure on the number of judges and the resources for each judge.

Mr. MOLLOHAN. Okay.

Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Relative to the ALJs, if it is simply a matter of a waiver? Is the OMB involved in this, as well?

Mr. PEARSON. OPM more directly.

Mr. FRELINGHUYSEN. Okay. Is there something we can do in our bill, in terms of language, that could help resolve this issue?

Mr. PEARSON. What would be needed, we believe, is——

Mr. FRELINGHUYSEN. Is there a legislative remedy outside of somebody putting in a bill?

Mr. PEARSON. It is a change in authorizing language, and I have no permission to come before you and suggest that that is an appropriate role for the Appropriations Committee.

But I would note that Senator Baucus has introduced a provision in a trade package back in August that would allow for the hiring of Section 337 judges specifically to address the concerns that we have been discussing.

Mr. FRELINGHUYSEN. The four judges you have now, are any or all eligible for retirement?

Mr. PEARSON. Three of the four are eligible for retirement. One of our judges is 77 years old, still enjoys his work a lot, but——

Mr. FRELINGHUYSEN. That is a huge amount of devotion. Just think if that person were to step down. From what you have told us, if you have a smaller pool of people from which to choose, you have a pretty difficult problem finding somebody to accept that or go through the process to be considered.

Mr. PEARSON. Right.

Mr. FRELINGHUYSEN. Are these presidential appointments?

Mr. PEARSON. No, we are able to hire them. The Commission does the hiring. And these ALJs are hired under the procedures—it is the Administrative Procedures Act, correct?

Mr. FRELINGHUYSEN. I want to get back to the whole issue of your complexity of your cases. Is it too much to say all your cases continue to be more complex, just the nature of the beast, whether they have to do with pharmaceuticals or technology?

Mr. PEARSON. That certainly is the trend in the patent case area. We have——

Mr. FRELINGHUYSEN. You have remarkable people who work with you, which you have pointed out. We are very lucky to have these people. But, in reality, we are moving into an area of greater complexity.

Mr. PEARSON. Without a doubt. And we have more claims per patent being contested. We have oftentimes petitions brought involving multiple patents, each with multiple claims.

Mr. FRELINGHUYSEN. You have gotten pretty high marks from everybody, in terms of your proceedings are identified with expeditious actions. So we are moving ahead to a situation where it will be potentially from 18 to more months? Is that where you are suggesting we are going?

Mr. PEARSON. Oh, we are there already, yes. And we are trying to push the tide back toward 15 months, is where we would like to go.

Mr. FRELINGHUYSEN. In your intellectual property proceedings, if they result in the finding of a violation and result in exclusion orders and cease and desist orders, who is responsible for enforcing them? Customs?

Mr. PEARSON. Customs enforces them directly. We provide guidance to Customs in terms of what specific tariff items are to be excluded. And their technical staff work with ours. And, on the whole, I think Customs does a good job of enforcing.

Mr. FRELINGHUYSEN. So they are effectively enforced?

Mr. PEARSON. Yes. There are instances——

Mr. FRELINGHUYSEN. Do you have any problems?

Mr. PEARSON. Oh, yes, sure. When——

Mr. FRELINGHUYSEN. Give us an example.

Mr. PEARSON. Well, what often happens is that an order will cover quite a specific product, and an importer will have a product——

Mr. FRELINGHUYSEN. Let's give an example. Is there a problem with this picking a product where there has been—or is this all, sort of, in the era of litigation?

Ms. ARANOFF. Just as an example, if there is a particular IT product, maybe a piece that goes into a computer that is covered by a certain patent, the engineers will design around it, and they will design a product that is going to do the same thing as this part that was found to be infringing. Someone has to make a determination of whether the design-around is actually far enough that it is outside the scope of the patent. And those sorts of things are frequently disputed.

Mr. FRELINGHUYSEN. Those would be within your purview?

Ms. ARANOFF. Sometimes. In the first instance, that would go to Customs. But there are times when people can actually come to us for an advisory opinion or an enforcement proceeding where it would go back to the ALJ for a formal adjudication.

Mr. FRELINGHUYSEN. How would you characterize Customs? Do they have people that are pretty well-qualified in some of these areas?

Ms. ARANOFF. You will have to ask them. They have an IP rights branch which handles these matters. Its staff is relatively small.

Mr. PEARSON. I think, if the questions get complex enough, they probably prefer that we look at it again and decide what——

Mr. FRELINGHUYSEN. Could you make any comments, in the Chairman's absence, on the probable effects in terms of the exiting free-trade agreements? You have completed all your work relative to the ones that are out there now; is that right?

Mr. PEARSON. Yes.

Mr. FRELINGHUYSEN. What areas do you expect your economic studies will focus on this year and next? USTR is pretty busy. Where do you see the next focus?

Mr. PEARSON. We are unlikely to do any more FTA reports for a little while. We hope sincerely at some point to be able to do a report on the Doha round, which, of course, isn't ready yet either.

Some of the work that we have been doing for USTR in regard to the Doha negotiations includes analysis of the nonagricultural market access negotiations. We have done a project for them to look at the economic partnership agreements that the European Union has been signing with its former colonies to try to understand, in aggregate, the effect those are having.

Mr. FRELINGHUYSEN. So you are looking at the trade agreements, as well?

Mr. PEARSON. Oh, yes. If the USTR asks us to do it, it is relevant to how USTR is trying to position in various ways, you know, in negotiations with other countries. So, yes, we have a much larger economic staff than USTR. I think they have 10 or fewer economists, and we have in terms of positions, what, somewhere over 40.

Mr. FRELINGHUYSEN. So these are men and woman who are familiar with Central America, South America, and Africa?

Mr. PEARSON. Right. One of our divisions is a regional analysis division, one of our divisions in the economics group. We have three divisions. So we have some people who try to look at the world in terms of its regions, to understand what is going on in the various areas.

Mr. FRELINGHUYSEN. Does the USTR have her own equivalent, or are you her main backup in this area?

Mr. PEARSON. Because their staff is so small and I think they deal much more with the moment-to-moment issues of the negotiations, we serve what you might call a back office function or a backup function, where the more complex, bigger projects they hand off to us, and they give us anywhere from 2 weeks to 1 year, and we try to give them an answer.

Mr. FRELINGHUYSEN. I think we are going to take a brief recess until the Chairman comes back, if that is all right.

Mr. PEARSON. That would be just fine. I recall well—the tag-team effort that the two of you put in last year was admirable.

Mr. FRELINGHUYSEN. I was rehashing a number of questions.

Mr. MOLLOHAN. I am sure it was the same ones. Thank you, Rodney.

Did Mr. Frelinghuysen talk about countervailing duties and antidumping? No? I can safely get into that without asking you to repeat?

The fiscal year 2009 budget request states that import injury investigations are projected to increase by 10 percent because of increased filings of the antidumping and countervailing duty petitions. In your statement, you mention seven new CVD investigations filed against products from China in the past year and project they will remain at relatively high levels in fiscal years 2008 and 2009.

Please explain how the U.S. Department of Commerce's recent decision to apply the CVD to non-market economies such as China effects the levels of filings of this type of petition.

Mr. PEARSON. Sure. Some U.S. industries have been concerned, because when they have brought just antidumping petitions against the Chinese, sometimes the margins have come back at relatively modest levels. Some of the Chinese firms have been effective at retaining counsel and working with the Department of Commerce, and they have argued successfully for relatively modest margins. Given the cost advantages that some Chinese firms have, they have still been able to export to this country without a huge restriction despite the antidumping order.

So I think that by—the reasoning of the Department of Commerce, I think, was that if they were to look at the subsidies in China, which we understand there are quite a few, and then calculate a subsidy margin, that perhaps the antidumping-plus-CVD margin would be sufficient that it would be harder for firms from China to export products to the United States.

So, in other words, once that door is open, then U.S. firms may be more likely to file cases.

Mr. MOLLOHAN. Are there any other reasons for the increased filings?

Mr. PEARSON. I think that it is not possible to ignore the economy. As we see the economy slow down, as we see demand weaken, there just isn't room left for firms to sell at profitable prices with a shrinking or a weakening demand base.

So this is normal. I mean, our workload in antidumping/countervailing duty cases tends to be counter-cyclical. The better the economy is, the fewer cases we have filed. When the economy heads south, our caseload goes up. So, without knowing any precise numbers, we would anticipate that we are going to see some filings through this time of weak economic growth.

Mr. MOLLOHAN. What other countries are involved besides China?

Mr. PEARSON. Well, we see quite a variety of petitions. We have one that we have just dealt with involving France only. We have quite a few involving India, Thailand.

When we are reviewing existing orders, we often—we have been dealing with Ukraine and Eastern European countries, as well as, you know, some of the Western European countries, occasionally

South American countries. Particularly Brazil is a major exporter; it shows up occasionally.

If you would like, I can provide in post-hearing a more thorough review of countries that we have been involved in in the past year. That would be simple enough.

[The information follows:]

Question. What other countries are involved [in antidumping and countervailing duty investigations besides China?

Answer. In FY2007 and year-to-date FY2008, antidumping and countervailing duty cases have been filed with respect to imports from the following countries: China—20 cases, Korea—4 cases, India—3 cases, Germany—2 cases, United Arab Emirates—2 cases, Australia—1 case, Brazil—1 case, France—1 case, Indonesia—1 case, Japan—1 case, Mexico—1 case, South Africa—1 case, Taiwan—1 case, Thailand—1 case, Turkey—1 case, and Vietnam—1 case.

Mr. MOLLOHAN. Do you have any steel cases pending?

Mr. PEARSON. Yes. We have a hearing for next, what, next month sometime on stainless steel pipe from China.

[The information follows:]

Question. Do you have any steel [antidumping or countervailing duty] cases pending?

Answer. Active Steel Product Investigations:

1. Steel nails/China & United Arab Emirates.
2. Circular welded carbon-quality steel pipe/China.
3. Light-walled rectangular pipe and tube/China, Korea, Mexico and Turkey.
4. Steel wire garment hangers/China.
5. Welded stainless steel pressure pipe/China.
6. Steel threaded rod/China.

Active Steel Product Reviews:

1. Carbon and certain alloy steel wire rod/Brazil, Canada, Indonesia, Mexico, Moldova, Trinidad & Tobago & Ukraine.
2. Steel concrete reinforcing bar/Turkey.

Mr. MOLLOHAN. Is that the only one you have, countervailing duty or antidumping case petition?

Ms. ARANOFF. That is the only new one. We are continuing to do sunset reviews on quite a number of steel-related orders.

Mr. MOLLOHAN. So all that represents an increased workload?

Mr. PEARSON. The new cases clearly do. See, in terms of the 5-year sunset reviews that we do, we know what is out there, because any time an order goes into effect, we know that 5 years later we are going to look at it again. So that is predictable; we can budget for that. The new cases are brought at the pleasure of the domestic industries.

Mr. MOLLOHAN. I know you have talked about this already in the hearing, but how are you with your current staffing levels? How are you meeting this demand? You have a higher demand here. You have a higher demand from the Congress, a request from the Ways and Means Committee.

Mr. PEARSON. We are meeting it with some difficulty, frankly. We are pushing people harder than we can over the long term. That is why I mentioned earlier it is important for them to see the light at the end of the tunnel, because people are——

Mr. MOLLOHAN. What is the light at the end of the tunnel?

Ms. ARANOFF. Getting the vacancy rate down.

Mr. PEARSON. The light they would see is if we have the 2008 appropriation we asked for, if we get the 2009 appropriation. Then I think there will be a general sense across the agency, “Okay, we are back. We are rebuilding. We are going to be okay.”

Mr. MOLLOHAN. But you really should be okay with the 2008 request you asked for, but you are saying the rent situation frustrated that; is that correct?

Mr. PEARSON. Yes, that is correct. Although what we have done is we have protected the personnel side of our plan and we have taken the hit on the IT side.

Mr. MOLLOHAN. If you protected the personnel side, then your 2008 request should have taken care of your personnel needs. But it hasn't taken care of your personnel needs.

Mr. PEARSON. Well, I see what you are saying, but, in fairness, it is very difficult for us, given the specialized requirements we have for many of our offices, to just go out and in one fiscal year hire all the——

Mr. MOLLOHAN. Do you have the money to do it?

Mr. PEARSON. We have the money this year to get our vacancy rate down from 16 percent to 9 percent by the end of September, which we hope to do, which is about as much as we think we can absorb this year. That is why to have continuity through fiscal 2009 is so important to us, because, otherwise, we are going to have the job half-finished, with the risk that we have to turn around and start reducing employment again.

Mr. MOLLOHAN. You have to be approved by OMB; is that correct?

Mr. PEARSON. Our appropriation request has to be submitted to OMB, but they can't adjust it. It is one of the elements of our independence.

Mr. MOLLOHAN. And I remember that.

Mr. PEARSON. We are one of the most independent of all independent agencies. You know, six commissioners, no more than three from any one party. We serve 9-year terms, staggered with one term ending every 18 months. We all outlive any administration. And the chairmanship flips back and forth every 2 years by presidential designation.

Mr. MOLLOHAN. You didn't adjust your request based on anything OMB had to say about it?

Mr. PEARSON. No, not at all. It passes directly through to you, and we are very much subject to whatever you should decide, which is why we appreciate this opportunity to visit.

Mr. MOLLOHAN. And we want to help you. So your $73.6 million is what you all have sat down and said, "That is what we need for 2009"?

Mr. PEARSON. Right. The commissioners met in late August, early September, I guess, and approved this figure. So we have, like I said, bipartisan and unanimous agreement with this request.

Mr. MOLLOHAN. Okay.

Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. That is pretty good and admirable.

I just want to get to the rent increase and GSA. Did you protest, or what did you do? You didn't take the rent increase sitting down when they made initial projection of 15 and then came up with somewhere between 38 and 40 percent.

Mr. PEARSON. Right. We did not take it sitting down. But in the short term, they have the right to take out of our accounts however much money they want, on a monthly basis. So they go ahead and get their money, and we have to live with that.

Mr. FRELINGHUYSEN. You protested, but what did you actually find out? Do you think that there was any justification?

Mr. PEARSON. Well, they have their rationale. It is just they did not communicate it to us.

Mr. FRELINGHUYSEN. What do you think their rationale might be? What did they tell you?

Mr. PEARSON. Let me turn to Mr. McLaughlin.

Mr. MCLAUGHLIN. Most of my summer was spent on this rationale.

The short version of the story is what we were being quoted as our price was not the bottom-line price; it was GSA's costs. So notwithstanding our request for a budget figure, they were quoting us their cost. They are renting the property from Boston Property. They did not disclose to us that, oh, by the way, their cost doesn't include operating fee escalations for the last 10 years and real estate escalations for the last 10 years and their 8 percent administrative fee, which totals $1.3 million.

Mr. FRELINGHUYSEN. Oh.

Mr. MCLAUGHLIN. That was my reaction.

Mr. FRELINGHUYSEN. Well, I am glad we have it entered into the record, because obviously this impacts other agencies and groups that come before us. I would think, obviously, those figures were set before maybe our economy was headed south.

I just have a question on Thailand. When I was in Thailand in late August, I met with a variety of people at the embassy. The Thai case you are talking about here, didn't that involve pharmaceuticals? Any of you familiar with that issue? I know there are things going on there where people are not playing by the—rules.

Mr. PEARSON. I don't believe we have had a pharmaceuticals case in front of us.

Mr. FRELINGHUYSEN. The Thai issue, you don't remember what that was?

Mr. PEARSON. We had a steel case involving Thailand, a review of an old order, and then a little more than a year ago, we had a case involving crushed canned pineapple from Thailand and other countries.

Mr. FRELINGHUYSEN. Interesting, somehow I thought there was some sort of pharmaceutical case that was involved.

Mr. PEARSON. And that is not impossible. We could have easily had an intellectual property case, a 337-case, that might have involved one or more producers in Thailand. And I wouldn't know that unless I went and looked at it closely. We do as a practical matter deal with some biotech and pharmaceutical cases on the patent side.

Mr. FRELINGHUYSEN. Were you involved in any way in any of the Mattel stuff with toys?

Mr. PEARSON. No, we watched that from the side lines wondering what it would mean for the bilateral relationship, but there was no trade remedy case brought before us, and we have not been asked to look specifically at toys by the Rangel study that we are doing on China. The request for the study preceded the concerns with toys.

Mr. FRELINGHUYSEN. Even though maybe the Chinese are to be blamed, obviously, these were American companies that are contracting so there are obviously obligations they have.

Mr. PEARSON. Important lessons to learn about one's supply chain, I think, yes.

Mr. FRELINGHUYSEN. Absolutely.

Thank you, Mr. Chairman.

Mr. MOLLOHAN. With regard to your exemption from OPM's ALJ pool requirement. Does your request or desire to be exempt from OPM's ALJ pool and priority, does that have to be coordinated through and approved by OMB?

Mr. PEARSON. No. I mean, if OPM had some administrative authority that it was willing to use to grant relief, then perhaps OMB would have to look at it. I don't know that. But OPM has made it clear to us that they don't think they have the administrative authority, and if they did have, they wouldn't be inclined to use it, because they are not eager to start what they would see as a slippery slope by making an exemption for one small agency, because then what would come next in terms of requests.

Mr. MOLLOHAN. In July of last year you released a report on certain economic effects of U.S. restrictions on agricultural sales to Cuba.

Mr. PEARSON. Yes.

Mr. MOLLOHAN. I have a series of questions on that, please. What factors raise the cost of U.S. Goods for Cubans and limit U.S. sales? What factors raise the cost of U.S. goods for Cubans——

Mr. PEARSON. Okay.

Mr. MOLLOHAN [continuing]. And limit the U.S. sales.

Mr. PEARSON. I will try to answer these, I have not looked at that study now in over half a year, but off the top of my head.

[The information follows:]

Question. What factors limit U.S. agricultural sales to Cubans?

Answer. Several factors, both economic and non-economic, limit U.S. agricultural sales to Cuba. Beyond the additional costs of U.S. goods mentioned above, Cuba is unable to benefit from several USDA credit programs that provide low-interest credit for the purchase of U.S. agricultural products. Such credit is available to the Cuban Government from many U.S. competitors, such as France, China, and Vietnam. Even though the United States is able offer Cuba high quality agricultural products at prices lower than most competitors, non-economic factors are important to Alimport in making its purchasing decisions. For example, Cuba seeks to diversify its agricultural import suppliers, not only to avoid becoming too reliant on any single country, but also to develop favorable geo-political relationships (such as with China and Venezuela). U.S. travel restrictions also limit our agricultural sales to Cuba in a number of ways. For example, reducing the number of U.S. citizens able to travel to Cuba lowers demand for U.S. products in Cuba. Further, Cuban officials wishing to visit the United States in order to inspect U.S. processing and port facilities, a prerequisite in many cases for purchases, have difficulty obtaining visas from U.S. authorities. Similarly, U.S. exporters face time-consuming and complicated procedures in obtaining licenses for travel in order to conduct essential face-to-face business negotiations in Cuba.

Question. What factors raise the cost of U.S. goods for Cubans?

Answer. Sanctions prevent the Cuban Government entity, Alimport, (the sole purchaser of U.S. agricultural products) from conducting financial transactions with U.S. banks. This means that Cuba must make payments for U.S. agricultural sales through third-country (typically European) financial institutions. The additional costs associated with such third-party transactions, including currency conversions, raises the price of U.S. goods paid by Alimport. Also, compliance with stringent financing regulations often results in delays at U.S. ports, leading to additional shipping costs for Alimport. Sanctions also penalize shipping companies whose vessels enter Cuban ports. As a result, few companies service Cuba and a lack of competition among shippers leads to higher freight charges on goods coming from the United States.

The majority of U.S. agricultural products imported by Alimport are distributed directly to the Cuban population through government-run ration stores. However, some products imported from the United States are resold by Alimport to private sector grocery outlets, hotels, and restaurants. As the sole buyer and seller, Alimport is able to charge higher prices to these private sector outlets than if these outlets purchased directly from U.S. suppliers. Overall, the ITC estimated that sanctions raise the cost of U.S. goods for Cubans by as much as 2.5 to 10 percent, depending on the products.

Mr. MOLLOHAN. Okay, go ahead.

Mr. PEARSON. There is the travel restriction that makes it challenging for people who want to go to Cuba on sales calls to do so, so that is one factor. And there are the financing issues where U.S. financial institutions can't be involved in a trade with China—Cuba, excuse me. Those would be the two things that would come to me.

Mr. MOLLOHAN. What agricultural commodity sectors would likely benefit most from the lifting of financial restrictions on U.S. agriculture exports to Cuba? I will submit these for the record.

The recent WTO rules draft apparently included changes with regard to the administration of sunset reviews, and the new provision would perhaps provide for mandatory sunset trade relief at 10 years. Is it true that the WTO rules draft provides for mandatory sunset trade relief at 10 years?

Mr. PEARSON. Yes, the chairman's draft that is currently under consideration does include a provision that would sunset all orders after 10 years.

[The information follows:]

Question. What agricultural commodity sectors would likely benefit most from lifting of financial restrictions on U.S. Agricultural exports to Cuba?

Answer. The United States export a wide range of agricultural commodities to Cuba, including food and feed grains, soybeans, dry beans, dairy and meat products, fresh fruit and vegetables, and a variety of processed food and beverages. The ITC estimated that U.S. agricultural sales to Cuba could double absent the financial restrictions. Sales of all products would benefit from lifting financial restrictions, with fruit and vegetables, meats, bulk dairy products, and processed foods benefiting the most.

Mr. MOLLOHAN. Well, what effect will this have on U.S. citizens who have used the existing trade laws to obtain relief from unfair trade practices?

Mr. PEARSON. It would require them to come back and file a new case. Now, my understanding is that the chairman, without defining it, has indicated that he would be open to some expedited procedure in that situation. But at this stage of the negotiations, that is only a concept; it is nothing more than something we could speculate on.

Mr. MOLLOHAN. I understand that some members of the Commission recently traveled to Geneva to meet with officials to discuss these issues. Can you elaborate on those meetings? Did you travel?

Mr. PEARSON. Certainly, yes. Four of the commissioners went. It had been several years since we had been there, there had not been a lot happening in the Rules negotiations, okay? So we didn't want to spend unnecessary time there. And I should explain, too, that the Commission does not negotiate directly on Rules. Those negotiations are handled by Commerce and USTR. The reason that both

Congress and USTR want us to be informed and kind of a part of the process is that, at some stage late in the game, we are going to get a phone call saying, okay, the language on material injury is this, can you live with it? And of necessity we need to be aware of what those changes are, what changes are being proposed.

But there are suggestions to change the material injury standards that are of some concern, and those were the ones we were primarily focused on. Sunset, although it would have an effect on us, there was nothing there that we would—that we would take a position on, because it is kind of outside the scope of what we should focus on. We have been very scrupulous to leave to Commerce and USTR the things that are their——

Mr. MOLLOHAN. So you would not have commented on the sunset provisions?

Mr. PEARSON. If it goes into effect, it may or may not change our work load; it depends. If new petitions are filed, that may have the effect of increasing our work load. If new petitions are not filed, our work load would go down. We kind of know what is out there for work load if we are just doing a review every 5 years. It is a little easier for us to plan.

Mr. MOLLOHAN. Okay.

Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. I am all set, Mr. Chairman, thank you.

Mr. PEARSON. Mr. Chairman, could I add it has been pointed out to me, you had asked earlier about steel cases. We do have a case involving steel nails from China and—is it the United Arab Emirates? I think it is probably Dubai, and that is in front of us now. It is not one of our traditional steel cases, but it is a steel product.

Mr. MOLLOHAN. Okay, Mr. Fattah.

Mr. FATTAH. I will pass this round.

Mr. MOLLOHAN. We're done.

Mr. FATTAH. We're done? I have some questions that I will submit for the record.

Mr. PEARSON. That would be fine, thank you.

Mr. MOLLOHAN. Thank you, Mr. Fattah.

Mr. Chairman, Madam Vice Chairman, Mr. McLaughlin, we appreciate your testimony here today, thank you again for your good work. There will be some questions submitted for the record. Mr. Fattah has indicated his interest in doing that, and we may as well. That was excellent testimony, and again, I appreciate very much your good work. And if you will please give my personal regards to Commissioner Lane, I'd appreciate that.

Mr. PEARSON. I would be pleased to do so. And again, we appreciate so much the attention that you give to our little agency. I mean, we do our best, and we may be one of the most bipartisan places in town. We try hard to maintain that working atmosphere and to have good relations with the Hill, so thank you.

Mr. MOLLOHAN. You are small enough that these accounts get scrutinized, which is important to do. But you know, we want to be responsive to your needs, so you need to come forward with what they are. Thank you for your testimony.

Mr. PEARSON. Thank you.

Mr. MOLLOHAN. And the hearing is adjourned.

[Questions and answers submitted for the record follow:]

United States International Trade Commission Answers to House CJS Subcommittee Questions on ITC FY 2009 Budget

Questions from Chairman Mollohan

Questions 1-3:
Assume there will be a three to six month continuing resolution (CR) for fiscal year 2009, at fiscal year 2008 funding levels. The Commission currently has a 16 percent vacancy rate, which it plans to reduce to nine percent by the end of fiscal year 2008. However, Chairman Pearson testified that a continuing resolution at fiscal year 2008 levels would force a $3.6 million personnel compensation decrease, and an immediate reduction in force (RIF) as a result. The only alternative to a RIF is to allow an average vacancy rate of 16 percent over the FY 2008 fiscal year. Can the Commission thread the needle and hire some additional staff without decreasing vacancies to the point that a CR will force a RIF? If so, will the Commission have enough staff to accomplish its mission?

Answers: Reducing personnel expenditures
If it was clear on Oct. 1, 2008 that the ITC appropriation for FY 2009 would be frozen at the FY 2008 level, the Commission would need to take steps to raise its average vacancy rate for FY 2009 to 16 percent. A direct way to reduce personnel expenditures would be to implement a RIF, which would require at least 120 days to become effective. Reductions in personnel-related expenditures would begin to be realized in February 2009. The exact size of the RIF would depend on the vacancy rate at the start of the fiscal year and the number of retirements expected to take place in the first months of FY 2009.

Rather than having certainty at the start of the fiscal year regarding the ITC funding, the Commission anticipates operating under a continuing resolution for three to six months before learning the amount of its FY 2009 appropriation. At that point, a RIF is unlikely to be an effective means of managing the ITC cash flow. The 120-day delay between when a RIF is decided and when the vacancy rate actually rises would delay the onset of savings until sometime in the summer of 2009.

A more flexible alternative for achieving personnel savings might be to implement unpaid furloughs, which potentially could be applied to all Commission employees except the administrative law judges (ALJs). A full-year freeze at the FY 2008 funding level would be expected to require somewhere between 15 and 30 days of furloughs.

Either a RIF or furloughs sufficient to address a full-year freeze would be expected to impair substantially the ITC's ability to accomplish its mission. There would be a distinct possibility that statutory deadlines for antidumping (AD) and countervailing duty (CVD) investigations would not be met. Completion of section 332 studies of trade and economic issues likely would be delayed beyond the agreed dates. Schedules for completing section 337 intellectual property investigations likely would experience significant extensions. In addition, either a RIF or furloughs would have meaningful adverse implications for staff morale and would complicate our ability to recruit new staff once funds become available.

With less than six months to go prior to the start of FY 2009, it seems reasonably likely that the Commission will not succeed in bringing its vacancy rate down to our year-end goal of 9 percent. It has proven more challenging than expected to recruit people for certain key positions. Those efforts are ongoing, but the hiring delays nonetheless probably will have the effect of holding our vacancy rate higher than planned on Oct. 1.

In other words, we may be moving in the direction of threading the needle. A three-to-six-month CR likely would be handled by curtailing hiring for several months while we await a final appropriation for FY 2009. Depending on the size of that appropriation, we may or may not have to initiate furloughs to balance the budget. Neither curtailing hiring nor implementing furloughs would be helpful developments as we strive to strengthen our human resources and accomplish our mission effectively.

Section 337 and AD/CVD filings have grown beyond expectations since our appropriations request was prepared in September 2007. It seems likely that new case filings will continue to grow. Under those circumstances, the Commission is at some risk of not having enough staff to accomplish its mission fully under any scenario in which our FY 2009 appropriation is reduced below the requested level of $73.6 million.

Bottom line: If the Commission had known as much in September about our caseload as we know now, we would have sought an additional $1-2 million above the requested appropriation of $73.6 million.

Question 4:
During the testimony, the Commission identified two areas that are at increased risk while the focus is on filling vacancies: risk of system failures, and a documentation issue. Please elaborate on these risks by describing the problems and the extent of the risks, as well as any adaptations or adjustments that the Commission intends to make.

Answer: Risk of system failure
The ITC is exposed to increased risk of system failure from having deferred routine equipment replacement. These deferrals have allowed us to reduce

expenditures during the freeze in FY 2007 and to offset partially the unexpected increase in GSA rent charges in FY 2008. We also have significantly reduced funding for services relating to maintenance of information technology systems. Planned enhancements to information security and related projects will be delayed at least until FY 2009. The extent of these risks is difficult to quantify as it depends on potential failure of aging equipment or potential security breaches.

Answer: Documentation
The basic issue regarding documentation is that the Commission is required by FISMA (Federal Information Security Management Act) and other OMB mandates to document that specified security measures are in place and appropriate procedures are being followed. We have security measures in place, but are not currently in full compliance with the documentation requirements. Generating the needed documentation is time-intensive and costly, requiring services that can be provided most feasibly by contractors. We look forward to obtaining funding that would enable us to pursue proper documentation and testing of our security measures. The process of documenting and testing can often lead to further improvements.

The Commission deferred $1.3 million of planned FY 2008 expenditures on equipment and services into FY 2009 as a result of the $1.3 million in increased GSA rent charges not covered in our FY 2008 budget request. Highlights include:

- Approximately $725,000 was cut from CIO Services that had been budgeted for a variety of projects:
  - Information Technology Security
    - $125,000 reduction for FISMA compliance efforts will make certification, accreditation, testing, and reporting on all Commission IT systems, including those containing National Security Information and Business Proprietary Information, more problematic.
    - $100,000 reduction for E-Authentication project required postponing Commission compliance with OMB and FISMA requirements for remote access and protection of Personally Identifiable Information (PII) until FY 2009.
  - $150,000 reduction for Trade & Tariff Database projects resulted in postponing of system enhancements FY 2009.
  - $100,000 reduction for development and implementation of the next version of our electronic docket system EDIS will make implementation more difficult and may postpone it until FY 2009.
  - $100,000 reduction for Records Management reform will delay efforts to comply with OMB and NARA regulations.
  - $150,000 reduction for Continuity of Operations planning delays implementation and testing of the COOP plan until FY 2009.

_ $150,000 cut from CIO Equipment for server replacement including e-mail, remote network access, various trade databases, core website, intranet, EDIS and network servers.

_ $125,000 cut from Facilities Management Equipment for replacement of rooftop cooling units that support conference rooms, hearing rooms, and other special HVAC requirements.

_ Approximately $300,000 cut from Administration Services that had been budgeted for:

    o Agency-wide training for new analysts.
    o Consultants to help develop mediation program for intellectual property cases.
    o Human Capital Planning contractors to support hiring and staff development efforts.
    o Financial management contractors to assist in preparing financial statements.

Question 5:
How is the Commission preparing for the coming wave of retirements? How many employees will be eligible to retire (by position) over the next five years?

Answer: Retirements
In addition to the current 16% vacancy rate, 40% of the existing staff is eligible to retire in the next five years. The Commission expects to lose experienced staff in most offices of the agency. Tight hiring restrictions imposed during FY 2007 have exacerbated the problems that arise when expertise is lost. Our two-year staff rebuilding plan calls for reducing the vacancy rate to 9% by the end of FY 2008 and 7% by the end of FY 2009. An important goal of the rebuilding plan is to bring in as many younger people as possible to gain experience alongside staff who are eligible for retirement. However, we remain at significant risk of not being able to prepare the next generation of employees in a timely manner with the management skills and technical specialties needed to serve the core functions of the agency. The hiring restrictions likely to be in place during the expected CR in the first months of FY 2009 may further complicate this picture.

The Commission is particularly vulnerable to retirement in a few key occupation groups. First, 86% of nomenclature analysts are eligible to retire in the next five years. These analysts produce the HTS annually and prepare modifications to it. Second, 75% of ALJs currently are eligible to retire; we may experience a meaningful rate of turnover among the ALJs within the next five years. The ALJs are critical to managing the rapidly increasing intellectual property caseload. Third, 77% of our SES will be eligible to retire within five years, so our planning for the future will involve recruiting new managers either from inside or outside the agency.

Eligible for Retirement Within Five Years

Occupation Group	n Board	otal Retirement Eligible	%
Nomenclature Analyst	7	6	86%
Statistician	5	4	80%
SES	9	7	77%
ALJ	4	3	75%
Accountant	5	3	60%
S-15 Managers and Professional Support (GS-11 & up)	67	31	46%
General Support (GS 10 and below)	42	19	45%
International Trade Analyst	93	35	38%
Economist	34	12	35%
Attorney	54	9	17%

For human capital planning, the upcoming retirements and the high vacancy rates are troubling. But the focus should not be exclusively on retirement losses. For certain occupation groups, especially attorneys, retention is a far bigger problem than retirement. The Commission has great difficulty competing with private sector wages. As a result, most departures of attorneys - especially patent attorneys - are for more lucrative pay in the private sector. Other occupation groups, such as economists and international trade analysts, also frequently lose experienced staff to opportunities in other government agencies, academia or the private sector. The Commission is finding it increasingly necessary to provide recruitment and retention incentives, such as student loan repayment and relocation allowances, to attract and retain well-qualified staff. Although these incentives are justified and appropriate, they have the effect of increasing our overall personnel expenditures.

Question 6:
Please explain the steps that have been taken to change the Commission's authorizing language to provide it with relief from the OPM system. What is the current status?

Answer: Hiring section 337 judges
A bill sponsored by Senator Max Baucus, S. 1919, "A bill to establish trade enforcement priorities for the United States, to strengthen the provisions relating to trade remedies, and for other purposes, was introduced in the Senate and referred to the Committee on Finance. Section 601 of that bill contains language that would provide the Commission with expanded authority under Section 337 of the Tariff Act of 1930 to appoint hearing

officers, in addition to administrative law judges, to preside over section 337 investigations. This added authority would allow the Commission, in its discretion, to appoint hearing officers with the qualifications, including trial experience and substantive intellectual property experience, appropriate for conducting section 337 proceedings. The Commission would be able to continue to appoint administrative law judges through the process overseen by the Office of Personnel Management, but would not be confined to the latter process, which has long proven unsatisfactory. The ITC Trial Lawyers Association, composed largely of practitioners who represent clients in section 337 proceedings, supports the Commission efforts to enhance its authority in this area. (Note: The legislative language is provided in full below in response to Rep. Freylinghuysen's question #6.)

Questions from Congressman Freylinghuysen

Question 1:
How many active intellectual property proceedings do you have right now, and how doesthat compare to historical levels?
Answer: Section 337 proceedings
There are currently 53 active section 337 proceedings at the Commission - 52 are violation proceedings and one is an enforcement proceeding. From a historical perspective, the number of Section 337 investigations active during the course of each year has increased dramatically in recent years, as has the level of new complaint filings. In contrast to the 53 Section 337 matters currently active at the Commission, only 15 such matters were active in March of FY 2000 and 31 such matters were active in March of FY 2005. At this time last year, 42 Section 337 matters were active at the Commission.

On an annualized basis, a total of 25 matters were active during FY 2000, whereas 73 matters were active during the course of FY 2007. Thus, between FY 2000 and FY 2007, the number of active Section 337 matters per year nearly tripled. With six months remaining in FY 2008, 67 matters have already been active so far this year.

Question 2:
Is the number of new complaints continuing to rise? What is the new caseload so far this year?

Answer: New section 337 complaints
Yes. The number of new Section 337 complaints is, indeed, continuing to rise.

In FY 2000, the Commission commenced eleven investigations on the basis of new complaint filings, which was fairly consistent with the annual figures for new investigations throughout the 1990s. In FY 2005, 25 new Section 337 investigations were commenced, and in FY 2007, 31 new investigations were commenced. We are less than half way through FY 2008, and 25 new investigations have already been instituted this year. Moreover, by the end of April, the Commission will vote on whether to commence at least four more investigations based on recently filed new complaints.

Question 3:
You are seeking an increase of $1.3 million for your intellectual property work. What will that additional money pay for, and what resulting impact do you expect on your ability to dispose of your caseload?

Answer: Costs of intellectual property casework
The additional costs of intellectual property work in FY 2009 are due entirely to personnel costs. They consist of the salaries and benefits costs of a 5th ALJ

and related support staff (roughly $500,000), increased staffing in other offices that are responsible for these cases, and the annual federal pay raise for all staff who work in this area. We project about 63 FTEs of direct labor charged to intellectual property cases in FY 2009. This is the minimum necessary to maintain our ability to dispose of our current caseload.

Although there have been preliminary discussions about adding a sixth ALJ, no decision has been made to do so either in FY 2009 or in FY 2010. Such a decision will depend on the future evolution of the section 337 caseload. If the ITC expands to six ALJs, more staff may have to be added in the related offices that work on intellectual property investigations. To allow six ALJs to work effectively, the Commission also likely will have to acquire a third court room.

Question 4:
Does your budget request for FY 2009 make any assumptions about continuing growth in your IP workload, or does it assume that the caseload remains static?

Answer: Assumptions regarding growth in IP workload
In FY 2007, the number of active section 337 cases per month ranged in the low-to-mid 40s. At the time the Commission's FY 2009 budget request originally was formulated in September 2007, it assumed that active intellectual property cases would grow to about 50 per month in FY 2009 and then stabilize at that level. Subsequent events have proven that assumption to be too low. When we submitted our FY 2009 budget justification to Congress at the end of January, we projected a continued increase in active intellectual property cases to 58 per month by the end of FY 2009. As of March 24, we have 53 active cases with five complaints pending institution. The current staffing plan is not adequate to meet the demands of this caseload without significantly increasing the length of time it takes to complete investigations.

Question 5:
ITC proceedings are attractive to patent holders because they can expect prompt resolutions. Last year the average length of time taken to reach a final decision increased from 15 months to almost 17 months. What is the current average? What average time do you estimate that you would achieve in FY09 should your budget request be fully funded?

Answer: Timeliness of section 337 proceedings
Thus far in FY 2008, six section 337 investigations have concluded based upon a final determination on the merits of violation or no violation. The average

time to final decision in these six cases was 15.7 months. However, there currently are 17 pending investigations with target dates in excess of 15 months, the longest being 43 months (due, in part to a 24 month stay during PTO reexamination proceedings).

If the USITC's FY 2009 budget request is fully funded, the USITC will be better able to hire and retain enough experienced ALJs and other staff to handle the continuing surge in caseload. As a result, the agency anticipates being able to avoid further lengthening of the time to reach a final decision, and indeed may be able to reduce the time for average completion back to 15 months. However, the completion time will depend heavily on factors outside the agency's control, particularly: the number of new case filings; the number of cases that are settled by litigants prior to an ALJ's initial determination; and the ability to hire and retain experienced ALJs and patent attorneys, who have the opportunity to earn much higher salaries in the private sector. The departure of ALJs can lead to significant docket re-scheduling. The retirement of two judges last year was a major factor in the increase from 15 to 17 months in the length of proceedings.

Question 6:
Your testimony mentions the difficulties you have in hiring and retaining qualified Administrative Law Judges, and that language had been included in a Senate bill to allow you to select candidates with specific patent experience. Can you please provide that language for the record?

Answer: Language of S. 1919
The language that is contained in S.1919 is set forth below. Some modest changes to the language contained in the bill have been discussed with staff of the Finance Committee, but are not included below. Those changes are intended to ensure that the status of the hearing officers tracks as closely as possible that of existing administrative law judges, in order to ensure their independence.

SEC. 601. SECTION 337 JUDGES.

Section 337 of the Tariff Act of 1930 (19 U.S.C. 1337) is amended by adding at the end the following new subparagraph:

(o) Section 337 Judges-

(1) IN GENERAL- Notwithstanding the provisions of subsection 556(b) of title 5, United States Code, the Commission is authorized to appoint hearing officers, other than administrative law judges appointed under section 3105 of title 5, United States Code, to preside at the taking of evidence at hearings

required by this section and to make initial and recommended decisions in accordance with sections 554, 556, and 557 of title 5, United States Code, in investigations under this section. The hearing officers appointed under this subsection shall be known as section 337 judges.

(2) QUALIFICATIONS- A person appointed as a section 337 judge under paragraph (1) shall possess a minimum of 7 years of legal experience and be licensed to practice law under the laws of a State, the District of Columbia, the Commonwealth of Puerto Rico, or any territorial court established under the Constitution of the United States. The Commission may promulgate such other regulations as the Commission considers necessary with respect to the qualifications of section 337 judges, including technical expertise and experience in patent, trademark, copyright, and unfair competition law.

(3) ROTATION- Section 337 judges shall be assigned to cases in rotation to the extent practicable or as otherwise provided for in the Commission's rules.

(4) OTHER DUTIES- A section 337 judge may not perform duties inconsistent with the duties and responsibilities of a section 337 judge.

(5) REMOVAL- A section 337 judge may only be removed for good cause shown upon a hearing conducted on the record by the Merit Systems Protection Board. The failure of the Commission to adopt the initial or recommended decision of a section 337 judge shall not constitute good cause.

(6) COMPETITIVE SERVICE- Except as otherwise provided, the laws, rules, and regulations applicable to positions in the competitive service apply to section 337 judges. Upon appointment, a section 337 judge shall be paid in accordance with the pay rates of section 5372 of title 5, United States Code, commensurate with the pay rate of an administrative law judge with similar time in service. Section 337 judges shall not be Senior Executive Service positions for the purposes of sections 3131 and 3132 of title 5, United States Code.

(7) PERFORMANCE EVALUATIONS- Section 337 judges shall not receive performance evaluations and shall not be compensated based on performance.

Questions from Congressman Latham

Question 1:
Can you explain to the subcommittee the most significant impediment under the OPM system that makes it difficult for you to bring on the administrative law judges that you need, and the remedy that you believe is the easiest to attain in order to ease your problems?

Answer: OPM system for hiring ALJs
The Commission's administrative law judges must master and apply a diverse and ever-evolving body of intellectual property law and perform the technically difficult task of determining what patent claims mean. Section 337 cases regularly involve multiple patents in complex technological fields such as electronics, chemistry, and biotechnology. Given the ITC specialized needs, we sought a waiver from OPM requesting that they selectively certify candidates under 5 C.F.R. §332.403 for administrative law judge positions according to their experience with intellectual property law (patent, trademark, copyright) or experience with scientific matters. OPM refused our request for a waiver. Instead, OPM continues to provide a list of three eligible candidates based on the length of time they have been on OPM's list of qualified individuals. Criteria for being on the list include trial experience and other factors, but do not include either scientific knowledge or a substantive background in intellectual property law. As a result, obtaining ALJ candidates from the OPM list has proven largely unworkable for the ITC. Instead, the Commission has drawn its candidates from the ranks of ALJs currently employed by other agencies. Over the years this latter pool of candidates has provided a number of individuals who have distinguished themselves as ALJs at the Commission. However, recent experience has been that fewer and fewer sitting ALJs have been willing to apply for positions at the ITC. This may be due in part to the reality that the section 337 subject matter is very challenging, while ALJs are able to earn no more at the ITC than at other agencies.

The Commission believes that the easiest solution would be to provide the authority to appoint hearing officers specified in S. 1919. This would allow for the selection of section 337 Judges based on qualifications most relevant to section 337 proceedings. This would significantly expand the pool of candidates with the necessary experience and substantive backgrounds available to the Commission. The Commission would retain the ability to appoint administrative law judges through the existing process as well. S. 1919 would provide all of the protections for section 337 judges that administrative law judges currently receive, and would maintain the framework of formal APA adjudication by falling within the savings clause of 5 U.S.C. §556(b). S. 1919 would not eliminate the current administrative law judge positions; it would merely open up an equal but alternative avenue for hiring of judges at the Commission.

Question 2:
You have had a convergence of circumstances that seem to have put you in an awkward position with respect to your resources, one of which is an unanticipated large rent increase. Can you elaborate on the rent increase?

Answer: Rent increase
The Commission has been at its current location at 500 E Street SW since 1987. The building originally was constructed primarily to meet the Commission's requirements. It is owned by Boston Properties and rented through GSA on a 10-year lease. Our second 10-year occupancy agreement (OA) expired in August 2007. GSA has not yet been able to provide us with a new OA, so we are occupying the space in accordance with a letter of agreement signed with GSA when the previous OA was expiring.

The process of formulating the ITC FY 2008 appropriation request began in the spring of calendar year 2006. At that time Commission officials began repeated efforts to communicate with GSA regarding the likely increase in our rent under a new 10-year lease. We received a draft OA for FYs 2008-2017 in May 2006 indicating that our total rent bill for FY 2008 would be $7,011,000. That figure represented a 15-percent increase in our rent relative to FY 2007. Over the next 12 months, we received widely varying estimates from GSA regarding our rent costs under the new OA. When we questioned GSA about the variance from the draft OA figures, we were informed that we should ignore the other estimates and use the figures in the draft OA, which we did. Our FY 2008 appropriation request provided for the 15-percent increase.

To help justify to House and Senate appropriators the reasons for a 15-percent rent increase, the Commission asked GSA to provide real-estate data for comparable properties to illustrate that a 15-percent increase was in line with market realities. GSA did so, and never indicated that a 15-percent increase was too low. The ITC also specifically queried GSA as to whether the estimates in the draft OA included additional charges, such as real estate tax escalation or operating fee escalation. At no time did GSA indicate that other charges, such as the GSA administrative overhead fee or the accrued escalation fees, were not reflected in the draft OA. GSA regulations state, however, that an OA generally should describe such charges with the intent to minimize the customer agency's exposure to future unknown costs.

No subsequent drafts of the OA were delivered to the Commission after May 2006. It was only in August of 2007, a week before the lease and our OA expired, that the actual costs we would incur became apparent. At that time, GSA requested the Commission to sign a letter of agreement that would allow for billing to continue. Subsequent discussions revealed that the figure cited as the total bill in the draft OA did not include three major items: (1) over $300,000 in accrued operating fee increases since 1997, (2) almost $400,000 in accrued real estate tax increases since 1997, and (3) GSA's 8-percent administrative fee for lease management services. The total increase was $1.3 million over the figure provided in the May 2006 draft OA, resulting in a 38-percent increase in rent between FY 2007 and FY 2008.

In October 2007, in accordance with GSA rules, the Commission requested a one year waiver of GSA's 8-percent administrative fee based on its failure to notify the Commission in a timely manner that this fee was not included in the May 2006 draft OA. We have received no formal response from GSA to that request.

Question 3:
Where do you stand, going forward, with your overall staffing needs, and what level of funding would give you what you need to fix any personnel staffing deficiencies?

Answer: Staffing requirements
Full funding of the Commission's FY 2009 appropriation request will be sufficient to meet most of the staffing needs we currently are dealing with. It should allow us to reduce our current vacancy rate of 16 percent down to 7 percent by the end of FY 2009. We need to rebuild staff, and are in the process of doing so.

It is possible, though, that we will need to adjust our human capital plan by expanding the total number of positions devoted to the section 337 intellectual property caseload. The Commission decision to add a 5th ALJ, as provided in the current staffing plan, was premised on a long term average of around 40 active cases per month. Temporary increases in caseload to 50 could be managed with five ALJs and additional support in the Office of the ALJs.

However, current trends suggest that the section 337 caseload may well remain at or above 50 for an extended period of time. Thus, the ITC appropriation request for FY 2010 may seek funds for a 6th ALJ, plus related staff increases for the Office of the ALJs and other offices involved in intellectual property cases. Expanding to six ALJs would be expected to require additional office space and an additional courtroom, which also may be requested for FY 2010.

WEDNESDAY, APRIL 9, 2008.

OFFICE OF UNITED STATES TRADE REPRESENTATIVE

WITNESS

SUSAN C. SCHWAB, UNITED STATES TRADE REPRESENTATIVE

OPENING REMARKS

Mr. MOLLOHAN. Good morning and welcome to staff, Members, and the public. This morning, we welcome Ambassador Susan C. Schwab to testify on the United States Trade Representative's fiscal year 2009 budget request. This is her first appearance before this Committee.

Welcome, Ambassador. We look forward to working with you.

This year's budget proposes a slight increase of 4.9 percent. However, the justification clearly conveys the inadequacy of this request. Current FTE levels cannot be sustained at this level and other risks to the budget have been identified but not included.

Furthermore, the assertion is made that any remaining carryover funding will be exhausted in fiscal year 2008, leaving no capacity for unbudgeted events.

Yet, the annual performance goals and 2009 initiatives are far ranging. The workload will have to be managed by eliminating noncritical missions. Indeed, USTR has already begun deferring such missions in fiscal year 2008.

USTR plans to slow hires or not backfill vacancies, increase the number of unreimbursable detailees, and reassign personnel based on mission priorities. As a result, critical institutional knowledge may be lost.

This justification states, "This request significantly slows important administrative and infrastructure upgrades that commenced in fiscal year 2006," which were an attempt to reverse a decade of inattention to support and logistical needs.

You may recall that in fiscal year 2006, the President's proposed budget was just 38.8 million. Congress appropriated 44.6 million.

It has been two years since USTR has appeared before this Committee and we have a new Ambassador. Unfortunately, my concerns about the economic and social effect of free trade agreements on American communities has not abated in the intervening years.

There appears to be some progress on the inclusion of environmental agreements and labor principles into trade negotiations, but the U.S. is still disadvantaged on balance.

Moreover, the idea that nations should avoid using the environment and climate change as an excuse to impose trade restrictions is worrisome.

And then there's China. In 2006, USTR's top-to-bottom review of trade with China concluded that the relationship lacked equity, balance, and durability.

In October 2007, GAO testified before the House Judiciary Committee on Courts, the Internet, and Intellectual Property that U.S. intellectual property faces increasing risk of theft as U.S. firms integrate into the world economy.

"The severity of these risks has been intensified by weak enforcement in some countries, particularly China, whose enforcement challenges have persisted despite U.S. efforts."

In February 2008, the Department of Commerce reported that the trade deficit with China rose to 256 billion in 2007, the largest gap ever recorded with a single country. China has now surpassed Canada to become the U.S.'s largest source of imported goods and, yet, despite the decline in the dollar, U.S. exports to China fell 15 percent in January 2008 amid contentions of unfair manipulation of China's currency to keep its value low against the dollar.

The Committee looks forward to your thoughts on these issues, Ambassador Schwab. And so I will invite you to go forward with your oral testimony. Your written testimony will be made a part of the record. And then when Mr. Frelinghuysen arrives, we will give him an opportunity to make an opening statement.

Welcome.

Ambassador SCHWAB. Super. Thank you, Mr. Chairman. Thank you very much.

Mr. Chairman, members of the Committee, I appreciate this opportunity to discuss the fiscal year 2009 budget for the Office of U.S. Trade Representative.

As you know, the USTR is the lead agency in the U.S. government responsible for the development, the negotiation, and the implementation of U.S. trade policy. We are a lean, efficient, effective organization that currently boasts around 226 FTEs.

And the principal focus of virtually everyone on the staff is opening markets abroad for the products and services of American workers, farmers, and entrepreneurs. We negotiate agreements that level the trade playing field and hold our partners to their commitments.

Our trade policy and the agenda to deliver it has four main components. First, multilateral trade talks such as the WTO's Doha development round; second, regional and bilateral trade talks such as pending free trade agreements with Colombia, with Panama, and South Korea; third, monitoring and enforcement of U.S. rights under existing trade agreements; fourth, issue-specific problem-solving and negotiations on topics such as intellectual property rights protection, softwood lumber, removal of nonscience-based sanitary and phyto-sanitary barriers to U.S. farm exports, and the use of trade to contribute to international, environmental, and climate objectives.

Trade today is playing a larger role in our economy than ever before and while some sectors of the U.S. economy are under stress, more than 40 percent of U.S. economic growth last year was attributable to the growth in U.S. exports, goods and services.

With U.S. exports to our free trade agreement partners rising significantly faster than our exports to the rest of the world, our trade agenda is more important than ever.

I am here today to ask that you fully fund these very important activities for fiscal year 2009. With our funding levels relatively flat for the last two years, our office has been challenged to keep pace with our growing responsibilities.

USTR has a very high-skilled labor and travel-intensive job to do. And of the 45.2 million we spent in fiscal year 2007, 33 million or 73 percent went to payroll. Travel was the next highest expense at 12 percent.

In fiscal year 2008, our payroll increases to 35 million, primarily due to a cost-of-living adjustment, making payroll this year almost 80 percent of our current appropriation.

If the budget is cut below the President's budget proposal, the new USTR, the next USTR will have to reduce costs by cutting staff. This would seriously impair USTR's congressionally mandated mission of opening international markets to U.S. exports and enforcing trade agreements.

Let me briefly mention some of our activities and accomplishments if I may.

First, on the multilateral front, a successful WTO Doha round outcome is our top trade negotiating priority. This multilateral agreement in the WTO offers the potential to generate economic growth and development here and around the world and to help lift millions out of poverty.

We have worked since 2001 to achieve a successful Doha outcome that will open markets, generate new trade flows, and boost both economic growth and confidence in the global economy, but it is important that the United States stay a strong and active leader at the WTO so as to ensure maximum benefits to U.S. interests.

On FTAs, we are working very closely with Congress as we did last year to address the environmental and labor protections in four free trade agreements. The four FTAs that were pending before the Congress, Peru, Colombia, Panama, and South Korea.

We included at Congress's suggestion and in concert with a bipartisan agreement stronger enforceable provisions that have set a new standard in both areas, environment and labor protections for FTAs.

Monitoring and enforcing these and earlier labor and environmental provisions in our FTAs is important but also resource intensive. And with a substantial increase in the number of countries with which we now have FTAs jumping from three to seventeen during the course of this Administration, USTR's workload has grown dramatically. Despite this increase in workload, we have increased staff by only 13 percent since fiscal year 2001.

On the enforcement front, since USTR testified last before this Committee, we have initiated five WTO cases challenging China's trade practices. This brings the total number of cases filed against China to six since March 2004 when we filed the first ever case against China at the WTO.

As the result of filing one such case last year, China agreed to eliminate a dozen major export subsidies and important substitution incentives.

We also continue to challenge in the WTO the European Union's undue delays in approving agricultural biotechnology products. We have initiated two arbitrations against Canada to enforce bilateral softwood lumber agreement.

USTR has, as you know, an array of tools available to us to enforce our rights under trade agreements. And while litigation is never the preferred option, it is an option that we have and will continue to use when other efforts fail to resolve our trade problems.

Just briefly before closing, a couple examples of subject-specific negotiations or actions that we are engaged in.

First on intellectual property rights, we have made progress with several of our trading partners this past year in improving IPR laws and enforcement. For example, the three pending FTAs, Colombia, Panama, and South Korea all contain world-class IPR protections.

USTR uses our annual special 301 report that will come out later this month to guide our choice of policy priorities, our priority targets for addressing IP challenges.

In addition, we recently announced the launch of the negotiations of the new anti-counterfeiting trade agreement with key trading partners designed to hit a higher standard for combating intellectual property rights violations, piracy, and counterfeiting.

On trade and the environment, in addition to improving environmental standards through our free trade agreements, the United States together with the European Union recently submitted a groundbreaking proposal as part of the Doha round negotiations to reduce international barriers to trade and environmental goods and services, including important climate-friendly technologies such as clean coal, wind energy, and solar cells.

I would note that USTR depends greatly on our interdependent relationship with other agencies when we move forward with the Administration's trade agenda. In particular, we rely on the capacity building, development, and technical assistance provided by some of the development agencies to support in particular the labor and environmental provisions of the free trade agreements.

And since I know that these decisions are vested with another Subcommittee, I hope that you would keep that in mind because these are tools that we really rely on.

In conclusion, American taxpayers get an exceptional return on their investment in USTR and, therefore, I would respectfully ask that you fully fund our 2009 budget, fiscal year 2009 budget so that the work of the U.S. Trade Representative's Office can be smoothly transitioned to the next Administration.

Thank you for your time and I would be happy to take any questions.

[Written testimony by Ambassador Susan C. Schwab, United States Trade Representative]

WRITTEN TESTIMONY BY
AMBASSADOR SUSAN SCHWAB
UNITED STATES TRADE REPRESENTATIVE

HOUSE APPROPRIATIONS COMMITTEE, SUBCOMMITTEE ON SCIENCE, THE DEPARTMENTS OF STATE, JUSTICE AND COMMERCE, AND RELATED AGENCIES

APRIL 9, 2008 – 9:30 AM

Chairman Mollohan, Congressman Frelinghuysen, members of the Committee, I appreciate this opportunity to discuss the U.S. Trade Representative's 2009 budget.

Overview

Since you last heard from my predecessor, Ambassador Rob Portman, the Office of the U.S. Trade Representative (USTR) has been very busy with everything from opening new markets overseas through the negotiation of free trade agreements (FTAs), to making sure markets are staying open through the monitoring and enforcement of our existing trade agreements.

In recent years, we have more than doubled the number of countries with FTAs that the Office of the U.S. Trade Representative has negotiated and Congress has approved from eight to 17, including our latest one with Peru approved at the end of 2007. Yet our appropriations have gone virtually unchanged.

We are a very lean, efficient and effective organization currently with only about 226 full-time equivalents to cover U.S. trade policy, negotiations and agreements with the world. We are responsible for opening markets for the products and services created by American workers, farmers and entrepreneurs. We also must ensure that our trading partners live up to their World Trade Organization (WTO) and FTA commitments.

We have a pro-active trade policy and agenda to do just that. Our four approaches to trade policy are (1) regional/ bilateral trade talks, (2) global trade talks, (3) enforcement of trade agreements, and (4) subject-specific negotiations such as intellectual property rights (IPR) and environmental standards.

As you know, much of what USTR accomplishes, we do in conjunction with other agencies with varying missions. Certain aspects of U.S. trade law, such as the administration of our anti-dumping and countervailing duty laws, or export control laws, fall under the jurisdiction of other agencies.

USTR now has just under a year to achieve our immediate, primary goals, which include working with Congress to approve the pending trade agreements with Colombia, Panama and South Korea, and achieving a successful conclusion of the WTO Doha Round. At the same time, we will continue to enforce aggressively our existing trade agreements.

We are also moving forward with other trade initiatives, including leading multi-national conferences such as the Asia-Pacific Economic Cooperation (APEC) and other ministerials. Our staff continues to work on additional trade and investment agreements, such as Bilateral Investment Treaties (BITs), which protect the rights of U.S. investors; Trade and Investment Framework Agreements (TIFAs), which provide a forum to build more comprehensive trade relations and address barriers to U.S. exports at an early stage; bilateral efforts to open closed markets to U.S. exports ranging from beef to financial services; efforts to achieve an Anti-Counterfeiting Trade Agreement (ACTA) and other IPR protections; and negotiations to join the financial and investment chapters of the Trans-Pacific Strategic Economic Partnership Agreement (P-4).

With all of this in mind, I would like to emphasize that trade today is playing a larger role in our economy than ever before. While some sectors of the U.S. economy are under stress, more than 40 percent of U.S. economic growth last year was due to the growth in American exports of goods and services. Therefore, it is more important than ever for those of us in the business of trade to be diligent in our efforts to open international markets through trade agreements and through the enforcement of our existing agreements.

Some people consider those two roles – negotiation and enforcement – to be separate functions. They are often listed as separate line items in budgets, shown in separate boxes on organizational charts and discussed as separate entities in debates. However, for all practical purposes at USTR, they are both equally important tools in our fight to keep American workers competitive in the international market. Absent effective enforcement, a trade agreement can become just another piece of paper. Yet, it is not only the lawyers who prepare the cases who are responsible for enforcement. Every single negotiator who works for USTR understands that a core part of his or her job is holding other governments to their word.

The two roles are most effective when integrated, day-in and day-out, to address trade barriers and ensure that American goods and services are able to compete on a level playing field. We hope that enforcement through negotiations is successful and issues never make it to the dispute settlement stage. We would much rather solve a problem without having to file a case. However, a key part of solving problems is having both the ability and the willingness to use our dispute settlement options if and when negotiations fail.

Budget Request

I am here today to ask that you to fully fund these very important activities for Fiscal Year 2009.

As you can see from the earlier list of activities and responsibilities, the Office of the USTR has a very labor-intensive and travel-intensive job to do. Of the $45.2 million we spent in Fiscal Year 2007, $33 million or 73 percent went to payroll. Travel was the next highest expense at $5.6 million or 12 percent. That left only 15 percent of our budget to cover everything else including language translation services, security, rent, communications, utilities and the cost of maintaining a small office in Geneva, Switzerland, where the WTO is based. We also have a trade officer based in Brussels on a non-reimbursable detail to our embassy, and during FY 2007, we established an office in Beijing, China, which is currently staffed by three people.

In FY 2008, our payroll increases to $35 million, primarily due to a Cost of Living Adjustment (COLA), making payroll this year almost 80 percent of our current appropriation. As you know, the cost of everything is going up, especially the cost of fuel. And given that 12 percent of our budget is travel, this line item will increase even at the current level of travel. In past years we have been able to use "no-year" carryover balances to cushion the impact of sudden cost increases. Unfortunately, I expect we will use the remaining $2.2 million in no-year funds this year, leaving us with a zero balance for FY 2009. This makes fully funding the Administration's request all the more crucial.

The budget that you give the USTR today will not impact me or this Administration. Regardless of the outcome of events this year, I do not expect to be in this job beyond Jan. 20, 2009. The budget you approve for USTR will impact the next person who sits in my chair, and I can tell you that if the budget is cut, the first place the new USTR will have to go for cost reductions is to staff.

We currently employ only 226 full-time equivalents, including positions specifically created in response to Congressional concerns with China and intellectual property enforcement. But if in FY 2009 we are not funded at the President's Budget level, and in particular, if under a full-year Continuing Resolution we are funded at a level below the President's Budget, the next USTR will most likely have to make significant cuts to our staff to make up for the full COLA and other inflationary increases. Such an outcome will seriously impair USTR's congressionally mandated mission of opening international markets to U.S. exports.

Therefore, I respectfully request that this committee provide the level of funding necessary to keep American workers competitive in the global marketplace, and to support our nation's economic and foreign policy goals. It represents a promise to American workers, farmers and entrepreneurs that count on USTR to aggressively open markets, challenge unfair trade practices and enforce trade agreements.

Let me go into further detail about our agenda and what we have accomplished so far with the precious taxpayer dollars that you give us.

Free Trade Agreements (FTAs)

Since Ambassador Portman was last here, our office has put free trade agreements into force with six new countries, namely El Salvador, Nicaragua, Honduras, Guatemala, the Dominican Republic and Bahrain. We are working with three more countries, Oman, Costa Rica and Peru as they prepare to implement free trade agreements with us. To date Congress has approved FTAs with 14 countries during this Administration when you add in our free trade agreements with Jordan, Chile, Singapore, Australia and Morocco.

Over the past two years, we have also signed three additional FTAs with Colombia, Panama and South Korea, which are pending Congressional approval. As you know, we are currently working with Congress to pass the Colombia FTA, thereby opening a new market for U.S. exports with an ally that already enjoys duty-free treatment on most of what they ship to us.

Once approved, these trade agreements are dynamic, not static. Our negotiators and lawyers work closely with our FTA partners to ensure that they make all of the changes in their domestic laws and regulations necessary for them to comply with their obligations before the agreements take effect. In addition, once an FTA is in effect, our team of attorneys and negotiators must monitor those agreements to ensure they are followed to the letter. A lot of work goes into implementing before and after the agreement comes into force. And even though we have increased the number of countries with which Congress has approved FTAs by almost six-fold during this Administration – from three to 17 – we have increased staff by only 13 percent since FY 2001.

These agreements have been an enormous gain for American farmers, workers, entrepreneurs and consumers. U.S. exports to the 14 countries with which we have FTAs that have entered into force have grown over 40 percent faster than U.S. exports to the rest of the world.

WTO Doha Round Negotiations

A successful WTO Doha Round outcome is the top U.S. trade negotiating priority. The Round offers the potential to eliminate or significantly reduce trade barriers. The talks cover a broad range of topics including agriculture, industrial market access, services, rules, trade facilitation development, and several environment and trade initiatives. A multilateral agreement in the WTO offers the potential to generate economic growth and development here and around the world, and to help lift millions out of poverty.

Earlier this year, we received updated negotiating texts from WTO Negotiating Group chairmen that continue to be debated and to evolve in anticipation of ministerial-level engagement. Given that we do not know when, if or how many ministerial-level meetings might occur, it is hard to gauge the impact on the USTR budget. These meetings could range from only top level Ministers and/or officials to a worldwide WTO Ministerial such as was held in Hong Kong in 2005. The business of the WTO is the global trading system itself, and its operation is at the center of U.S. trade policy. The United States must continue to be a strong, active leader in meetings at all levels, so as to ensure U.S. interests are always being pursued.

Enforcement Efforts

USTR is not just in the business of negotiating new agreements and enforcing old ones – we are in the problem-solving business. That means using whatever tool gets the job done most effectively. Sometimes the best tool is dialogue and negotiation, sometimes the best tool is assertion of our rights through formal dispute settlement at the WTO or under our FTAs.

Since USTR last testified here, we have initiated five WTO cases challenging China's trade barriers. In 2006, we filed a case against China's discriminatory charges on imported auto parts. The final panel decision in this case will be public this summer. We are optimistic that the WTO will find China's barriers to be inconsistent with WTO rules. In 2007, we initiated WTO disputes challenging Chinese export subsidies and import substitution incentives, China's inadequate enforcement regime for intellectual property rights, and China's market access barriers to U.S. industries exporting and distributing publications, home entertainment videos, music and movies.

This year, we have filed a major case against China for its new regulation requiring foreign financial information suppliers to supply their services through an entity designated by China's regulatory authority. In addition, this regulatory authority appears to operate not only as the regulator of foreign financial information suppliers but also as a competitor in the domestic market, creating an untenable conflict of interest.

Agreement was reached last November to successfully resolve the case on prohibited subsidies, when China committed to eliminate the subsidies at issue effective January 1, 2008. Together with the case on financial information services that we launched in March 2008, this brings the total number of cases filed against China to six since March 2004, when we filed the first-ever case against China at the WTO. The U.S. has brought more cases against China at the WTO than any other member.

We also continue to challenge in the WTO the European Union's launch aid subsidies to Airbus and its undue delays in approving agricultural biotech products. In addition, USTR initiated two arbitrations against Canada under the bilateral Softwood Lumber Agreement.

These are just a few examples of USTR's enforcement efforts.

Subject-specific actions:

Intellectual Property Rights (IPR)

We made progress with our trading partners this past year in improving IPR laws and enforcement. For example, the three pending FTAs all contain world-class IPR provisions, and FTA partner countries such as the Dominican Republic have overhauled their IPR laws as part of the FTA implementing process.

Our strong IPR trade agenda also spurred progress in IPR enforcement abroad, contributing to concrete results such as actions against signal theft in Vietnam; raids of unlicensed optical disk plants in Russia; measures to reduce end-user software piracy and an agreement to strengthen enforcement against company name misuse in China; prosecutions for business software piracy in Taiwan; and seizures of counterfeit pharmaceuticals in Indonesia and Nigeria, to name a few.

In addition, we recently announced that the United States will work with key trading partners to set a higher international standard for combating counterfeiting and piracy by negotiating the Anti-counterfeiting Trade Agreement (ACTA). This agreement will bring together a group of countries who recognize the importance of, and are committed to, strengthening intellectual property enforcement to create an international Intellectual Property agreement based on best practices.

Environment

We worked closely with Congress last year to address environmental concerns in four free trade agreements – Peru, Colombia, Panama and South Korea. We included stronger, enforceable provisions that have set a new standard in that area for FTAs.

In addition, the United States, together with the European Communities, submitted a groundbreaking proposal as part of the WTO Doha Round negotiations to reduce international barriers to trade in environmental goods and services, including important "climate-friendly" technologies such as clean coal, wind energy and solar cells. The proposal lays a foundation for an innovative new WTO environmental goods and services agreement (EGSA). Another Doha Round environmental initiative being pursued by the United States in Geneva is an agreement to achieve dramatic reductions in subsidies that contribute to global overfishing of our oceans.

While we are very proud of these agreements and bold new steps, with these first-time agreements come first-time costs. In addition to our regular monitoring and enforcement duties, we now have additional obligations that our current staff must address without any additional resources to date.

For example, the recently approved Peru FTA includes a requirement that USTR lead an interagency committee to monitor timber shipments and request verifications of shipments/producers. This is a new responsibility for USTR, mandated by Congress to help Peru fight illegal logging and will require additional resources. In addition, Peru committed to dramatic improvements in both labor and environment with the understanding that our government would help fund its transition.

Additional funding

While the purpose of this hearing is to discuss USTR's budget, I think this is a good time to bring to the attention of the Committee the interdependence of our work and that of development and technical assistance. For example, it is well known that development and poverty reduction in sub-Saharan Africa will be enhanced if the African Growth and Opportunity Act (AGOA) is fully utilized. According to the Blair Commission on Africa, Africa's current share of world trade is only 2 percent, down from 6 percent in 1980. If Africa were to increase that by just one percentage point – to 3 percent – it would generate additional export revenues of $70 billion annually, nearly three times the amount of current annual assistance to Africa from all donors.

Development in countries that are free trade agreement partners will also be enhanced, and the President's FY 2009 Budget seeks increased funding for trade-related development assistance to assist our FTA partners in meeting their labor and environment FTA commitments. Although decisions on this issue are vested with another subcommittee, we hope you agree that this important aspect of our trade agenda should be funded at appropriate levels.

Conclusion

American taxpayers get an exceptional return on their investment in USTR. I hope you appreciate that USTR is a lean and efficient organization. Anything less than full funding of our budget request would make it extremely difficult for us to fulfill our increasing responsibilities to the American people. Salaries and travel expenses associated with negotiations and enforcement, which are the very core of how we do business, make up the bulk of our expenses.

Therefore, I respectfully ask that you fully fund our FY 2009 budget so that our work at the U.S. Trade Representative's Office can be smoothly transitioned to the next Administration at a level that will ensure that USTR can continue to open new commercial opportunities for American workers, farmers and entrepreneurs who rely on free and fair trade.

Thank you for your time, and I am happy to answer any questions you may have.

Mr. MOLLOHAN. Thank you.

I recognize Mr. Frelinghuysen for an opening statement.

OPENING REMARKS

Mr. FRELINGHUYSEN. First of all, let me apologize, Mr. Chairman, for being late.

And, Ambassador, it is my pleasure to join the Chairman in welcoming you for your first appearance before this Subcommittee.

You are requesting an appropriation of $46.3 million which provides no increase for your fiscal year 2008 operating level which included carry-over funds.

The fiscal year 2009 request provides no additional resources for pay, inflation, or other built-in cost increases, let alone any increases for the new initiatives that you have mentioned. This seems to me to be somewhat shortsighted given the very active trade agenda facing the nation.

As you said in your testimony, the American taxpayer gets an exceptional return in their investment in the USTR. I had an opportunity over the weekend with you to see some of that investment and the extraordinary amount of work that you have been doing relative to that trade agreement and so many others.

I also had an opportunity to take a close look at your 2008 national trade report, the NET, which substantiates very much to me your successes and many challenges. That is quite a list of accomplishments and a lot of barriers yet to overcome.

I believe that our security and prosperity are dependent upon active engagement in the global economy through free and fair trade. I am convinced and certainly even more so having been with you recently on a bipartisan trip that the Colombia free trade agreement will yield important economic benefits for the United States and Colombia and also will demonstrate support for a very strong ally.

The odds of President Uribe succeeding were long, but he has succeeded and now we need to match his courage and the work of the men and women who support him.

I am very pleased that you are here and I salute you for your work. Your budget needs a lot more money. As I know you said in your testimony and certainly in your published testimony, you are preparing for the next Administration and they have to face these challenges.

You are not only looking after your needs between now and the end of the year, but giving the next President the tools they need to open the marketplace for American goods and services.

Thank you, Mr. Chairman.

USTR BUDGET

Mr. MOLLOHAN. Thank you, Mr. Frelinghuysen.

Ambassador Schwab, I just point out that it puts the Committee in a difficult position when we receive testimony as late as we received your testimony. I do not know whether you know it or not.

We received your testimony 6:30 last evening, which actually was 15 hours in advance of USTR's hearing. That beats Census. Census was 19 hours in advance of the hearing. Of course, we gave about two postponements of their testimony in order to accommodate their trying to get their information together. But we have not even read and what we heard of your testimony is the first we heard of it. So it really does put the Committee in a difficult position.

Thank you for appearing at the same time.

In 2009, USTR budget includes an increase of $2.1 million. That is just under five percent of the fiscal year 2008 appropriation. However, this is just equivalent to USTR's fiscal 2008 spending level, which allowed USTR to spend 2.2 million in no-year carry-over funds in addition to the enacted level of 44.1 million.

Indeed, your justification makes it quite clear that 46.3 million, the President's request, is not enough, as Mr. Frelinghuysen is pointing out here, for fiscal year 2009, in part precisely because USTR will have exhausted all of its no-year carry-over funds in fiscal year 2008.

The justification states that, "This will be a challenge to USTR management."

On page 23 of the justification, USTR lists its fiscal year 2009 budget risk. Included on this list, but not in the budget, are first a WTO ministerial normally scheduled bi-annually which has not been assumed in this budget due to the current stage of the Doha negotiations.

Two, capital security costs in China related to the State Department's Global Embassy Construction Program that have not yet been charged to USTR despite the fact that it has been in Beijing since 2007.

Three, the need to strictly control personnel costs through deliberately pacing hiring requirements.

And, lastly, a new lease for the Ambassador's residence in Geneva.

Ambassador Schwab, this budget was developed some time ago and we heard from your office that the Doha round was heating up. Please update us on the Doha negotiations and explain how this affects the need for a WTO ministerial.

Ambassador SCHWAB. Thank you, Mr. Chairman.

As you note, the Doha round negotiation is heating up. It has done so periodically over the last several years. We are once again going to take a run at getting this elusive break-through that would open markets to trade in agriculture and manufacturing goods and services. And we do hope to see a ministerial sometime in the next two months or so.

Unlike the previous ministerial in December of 2005, which was in Hong Kong, this one would probably be in Geneva, which is slightly less costly for us because we have a small office in Geneva that can support us. So that is a good development.

The key to the Doha round from our perspective is to make sure that this multilateral development round meets the promise that was stated for it when it was launched in 2001, namely to help generate economic growth, including in developing countries, and to help alleviate poverty.

And the key, one of the key points that we have found is a challenge in this negotiation is ensuring that the emerging markets, the advanced developing countries, China, Brazil, India, others contribute to this market, opening at a level that is commensurate with their level of development.

Obviously the developed countries would be expected to do the most and the least developing countries are the ones that we are targeting for the most help, but everybody needs to contribute for this to be a successful round.

Mr. MOLLOHAN. Your risk was calculated at a million dollars for this ministerial. How risky is the exclusion of the ministerial request?

Ambassador SCHWAB. I would guess at this stage, first of all, the ministerial, assuming the ministerial takes place, and there will be a lot of developments in the next four to eight weeks to see whether we are ready for a ministerial, we cannot afford a failed ministerial again, assuming it takes place, my guess is that it will be less costly than the million dollars that it cost us to do the Hong Kong ministerial in December of 2005, and that if there is a second ministerial to eventually close the Doha round, it would be in the next fiscal year.

So we are talking about one in this fiscal year, one in the next fiscal year, but neither of them——

Mr. MOLLOHAN. What fiscal year?

Ambassador SCHWAB. One in fiscal year 2008, one that would be closer to the end of this calendar year, therefore, fiscal year 2009. Neither would be as costly as the Hong Kong ministerial was.

Mr. MOLLOHAN. How costly was the Hong Kong ministerial?

Ambassador SCHWAB. It was close to a million dollars. This was December of 2005.

But I would be happy to provide——

Mr. MOLLOHAN. Do you really think it is going to cost less than a million dollars? And even if it does, it is not provided for, so how are you going to cover it?

Ambassador SCHWAB. USTR has become pretty adept at setting priorities and making sure we have the resources available to fund those priorities. And there are other things that we could and probably should be doing that sometimes slip.

Mr. MOLLOHAN. Why do you not request it?

Ambassador SCHWAB. You know, obviously USTR, I am fully supportive of the President's request. We can manage with the President's request.

Mr. MOLLOHAN. I know you have quoted the President's request. We understand that. Why do you not request it?

Ambassador SCHWAB. For the ministerial?

Mr. MOLLOHAN. Yes.

Ambassador SCHWAB. In part because we have been planning. We have assumed or thought there would be a ministerial for several years running and there has not been one. We thought there would be one in 2006. We did not have one. We thought there would be one in 2007. We did not have one.

I cannot actually tell you there is going to be a ministerial in fiscal year 2008 or fiscal year 2009. We believe we are going to have a ministerial in fiscal year 2008 later on this spring, but that is not even set yet. And, therefore——

Mr. MOLLOHAN. Is the funding for that provided for?

Ambassador SCHWAB. We would make certain that we had the funding for that. And as I said, because that ministerial would be in Geneva, and my guess is both would be in Geneva, if there is one to get the break through and one to close the deal, my guess is both would be in Geneva.

And Geneva, while there has been some increase in cost associated with exchange rate changes in doing any of our travel, a Geneva ministerial will cost significantly less than a Hong Kong ministerial because we have the infrastructure of our office in Geneva.

Mr. MOLLOHAN. But just looking at probabilities, which is the way you are answering my question, just how risky is the exclusion? With what probability do you think you are going to have a ministerial in 2009?

Ambassador SCHWAB. In 2009?

Mr. MOLLOHAN. That is what this budget request is.

Ambassador SCHWAB. Right. I think there will be a ministerial. I suspect it will be on a smaller scale.

Mr. MOLLOHAN. Okay. But it is not requested in your budget request, right?

Ambassador SCHWAB. We do not know that there will be a ministerial.

Mr. MOLLOHAN. I understand. But you have not requested it? You have not requested funding for it, have you?

Ambassador SCHWAB. That is correct.

Mr. MOLLOHAN. Sorry. There is a number of risks as I went over. USTR has been in Beijing since 2007, but no capital security costs have yet been charged.

Has the USTR been in contact with State Department about a possible range and do you have any idea how much these costs might be?

Ambassador SCHWAB. We worked very closely with the State Department on this and to this point, we have not had to absorb a significant cost associated with this. I will continue to work with the State Department and the U.S. Embassy in Beijing to make sure that if they have to transfer those expenses to us that we are able to manage payment of those.

Mr. MOLLOHAN. Well, as I understand it, we used to fund State Department. They are supposed to charge you.

Ambassador SCHWAB. They are supposed to charge us $50,000 a person basically. We pay that. We have someone in Brussels and we pay that in Brussels. And so up to this point, we have not received a bill from the State Department.

We do an awful lot of work with and for the State Department. They are in many ways an extension of our mission. We are an extension of theirs. So far, they have cut us a break. We are talking about three individuals that we have in U.S. Embassy Beijing.

Mr. MOLLOHAN. Do you have any indication that you will or will not be charged in 2009 for the——

Ambassador SCHWAB. We do not have any, up to this point, we do have any indication. If we were charged in 2009, that would be an expense of approximately $150,000——

Mr. MOLLOHAN. Okay.

Ambassador SCHWAB [continuing]. For the three individuals.

Mr. MOLLOHAN. But you have no communication one way or the other from State Department to give you an inkling of whether you are going to be charged in 2009?

Ambassador SCHWAB. No, not to date.

Mr. MOLLOHAN. Okay. Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Satisfy my curiosity. I read in the newspaper the other day that the Chinese are aggressively pursuing like 30 free trade agreements and they concluded one, I think recently, with New Zealand. I know we monitor those, but obviously our focus here is on the budget as well as policy.

How do you match how we resource your people versus their negotiating teams? It seems to me you basically have had a sort of a budget freeze here for three years.

Knowing the Chinese, it seems like if we have three people in Beijing, that is a paltry amount considering the size of their marketplace. And as you make clear in your testimony, you are not only about promoting free trade and opportunities, you are also there to make sure that those treaties are enforced.

I would like to know what the literal impacts would be? Are you suggesting you are having a hiring freeze or your budget as submitted to us represents a hiring freeze? And given that, you would not have any ability to do anything more in Beijing in terms of adding people that you might need.

Ambassador SCHWAB. That is correct. We could not under this budget ramp up our activities in Beijing. We do not as a matter of course throw quite as many numbers of individuals at negotiations as the Chinese do. But, again, we work very closely with other agencies, the Congress Department, Agriculture Department, State, and so on.

Mr. FRELINGHUYSEN. ITA.

Ambassador SCHWAB. ITA. All of these other agencies, we work very closely with them.

No, we could not ramp up for a stronger presence in China. Our staff in China is almost exclusively an enforcement team. It is intellectual property rights. It is a team that supports our Joint Commission on Commerce and Trade activities, some of our strategic economic dialogue.

And what we end up doing is we spend a great deal of time with the Chinese on problem solving. And it ranges from, you know, jaw boning at one end of our toolbox to filing cases and retaliating at the other end.

And there we have much more engagement in terms of the Washington team of the General Counsel's Office, our China shop, our IP shop. So there is a lot of backup in Washington.

Mr. FRELINGHUYSEN. But with no more money for increases in your budget, there are going to be some pretty big impacts. Should we anticipate that you would have to implement a hiring freeze?

Ambassador SCHWAB. It is not our expectation to implement a hiring freeze. I do——

Mr. FRELINGHUYSEN. We gave you some help last year.

Ambassador SCHWAB. Right.

Mr. FRELINGHUYSEN. Up to 335, I believe.

Ambassador SCHWAB. Last year, what sustained us, in fact, in the last couple years——

Mr. FRELINGHUYSEN. Two thirty-five, yes.

Ambassador SCHWAB [continuing]. Is the no-year carry-over, which, unfortunately, we will have exhausted by the end of this fiscal year. I do not see us imposing. I would hope we would not need to impose a formal hiring freeze. But as you know, what you end up doing is you end up running vacancies longer than you might otherwise want to run vacancies. You deploy, you have to deploy resources to your highest priorities. Obviously enforcement and particularly enforcement vis-a-vis china is a very high priority.

Your point about free trade agreements, I think, is a worry for us because while we are not actively negotiating many free trade agreements at this point, there are hundreds of FTAs being negotiated around the world by our trading partners. And there are countries including China that are negotiating free trade agreements and regional trade agreements that could very well lock us out and disadvantage our workers, our farmers, and entrepreneurs.

One of the reasons we are so anxious to move ahead with the three pending FTAs before the Congress, Colombia, Panama, and South Korea, you mentioned the geopolitical implications. The trade implications are just as profound because right now in the case of Colombia, they get virtually unlimited access to the U.S. market under preference programs that have been around since 1991. And our guys are paying 35 percent tariffs on manufactured goods, 80 percent tariffs on farm goods, and this would level the playing field.

I mean, so the Colombia agreement for every day that we are not passing it, it is our workers and our farmers and our entrepreneurs who are getting hurt, who are paying hundreds of thousands of dollars, indeed, you know, millions of dollars in tariffs.

In the case of Panama, it is exactly the same. And in the case of the Korea FTA, that is as, you know, a large market with high trade barriers. We have low barriers in terms of what they ship to us. You both go to zero. You have got a lot of new market access.

And those three together, you are talking about customers, over a hundred million new customers for U.S. exporters.

Mr. FRELINGHUYSEN. I am highly supportive of all of what you are doing. I just want to make sure that there is a mandatory pay raise in here.

Ambassador SCHWAB. Yes, sir.

Mr. FRELINGHUYSEN. How are you going to meet that mandatory pay raise? Is there going to be some sort of reduction on the FTE side of things?

Ambassador SCHWAB. Our current plan would be, and we did articulate the budget risks as the Chairman noted, our current plan would be that we can manage with the President's request, that we would not expect to be cutting personnel, that we would need obviously to focus on our priorities, and there may be things that would slip in the process.

Mr. FRELINGHUYSEN. Can you provide, perhaps for the record, your fiscal year 2009 built-in costs associated with a 2.9 percent pay increase, pay raise in January 2009, and the cost of annualizing the three and a half percent pay raise in 2008?

Ambassador SCHWAB. I would be happy to provide that.

Mr. FRELINGHUYSEN. Somehow as we looked over some of your budget documents, it seemed to be lacking a little bit of a clarity in that regard.

Ambassador SCHWAB. I would be happy to provide that.

[CLERKS NOTE.—The information was not submitted before the print deadline.]

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Mr. Culberson.

Mr. CULBERSON. Thank you, Mr. Chairman.

I also want to tell you how much I appreciate the work that you do. Of all of the different agencies of the Executive Branch, your work in particular is extraordinarily important to the U.S. job market. And I share my colleague, Mr. Frelinghuysen's enthusiasm for free trade, but distressed to see once again, Mr. Chairman, the Administration's priorities.

As important as the Office of Trade Representative is, the White House continues to frankly short stick you and not give you enough money. And it is distressing to hear that you do not even have enough personnel to man the office in China sufficiently to be able to really engage them on a full range of issues that are important because the Chinese, our trade deficit with the Chinese is just awful.

And I wanted to ask just a couple of quick things. Where are we negotiating free trade agreements and with who? You said we were not really working on many. What others are out there that you are working on?

Ambassador SCHWAB. In terms of free trade agreement negotiations that are pending, there is an FTA with Malaysia that has been under negotiation where the negotiations have slowed of late, in part because the expiration of trade promotion authority and in part because their election and changing government as they sort themselves out.

We have other negotiations on trade and investment framework agreements, bilateral investment treaties. Those are being negotiated or negotiations are being explored with a number of countries.

We have recently entered a negotiation on the services, financial services and investment provisions associated with a group called the P4, which is a small Asian regional agreement that currently exists between Chile, Singapore, New Zealand, and Brunei. And we have got FTAs with two of the four. Because we are anxious not to be locked out of regional deals in the Asian market, joining the P4 at some point might be part of a way to integrate ourselves into Asia.

So in terms of formal free trade agreements, there is very little under negotiation at the present time for a variety of reasons. However, we do have, as I said, TIFA negotiations, BIT negotiations going on and a lot of troubleshooting and individual market opening activities.

EXPORT ISSUES

Mr. CULBERSON. And, finally, I just want to ask a very narrow question involving an employer in my district who manufactures forklifts who are upset that we export forklifts. Korea, China, others are hammering us with a big tariffs while we do not impose any.

I want to ask specifically have you raised that? My office and others have contacted you. Have you raised that yet and will you, please, try to get that resolved?

Ambassador SCHWAB. In the case of forklifts, in the case, we are aware that one of the principal benefits of the Colombia free trade agreement and the Korea free trade agreement will be the elimination of tariffs in both of those countries for U.S. forklift exports. And that will be of significant benefit to a variety of U.S. manufacturers of forklifts, earth-moving equipment, tractors, and so on.

In the case of China, the Chinese tariff has been brought down through its accession to the WTO. I am not exactly sure where it is now, but I certainly will look into it.

Our hope would be if we get a Doha round multilateral trade agreement, that will be a great venue, a great opportunity to reduce some of these tariffs.

Mr. CULBERSON. Okay. But rather than just look into it, I am asking specifically will you raise it, please, with the Chinese? This is a really important issue and it is hammering our forklift manufacturers.

Ambassador SCHWAB. I will do so, absolutely.

Mr. CULBERSON. Thank you.

Thank you, Mr. Chairman.

Mr. MOLLOHAN. Mr. Schiff.

INTELLECTUAL PROPERTY ISSUES

Mr. SCHIFF. Thank you, Mr. Chairman.

Madam Ambassador, I want to ask you a number of questions about intellectual property issues which are very important to not only the country at large but certainly a great many of my constituents in Southern California.

Along with several of my colleagues, I am co-sponsoring legislation called the PRO IP Act which you are probably familiar with. A number of proposals that I have made have been incorporated into the bill.

I understand your office has raised some concerns with this legislation recently, and the inability to resolve some of those concerns has hindered the progress of the bill moving forward.

One issue in particular, and I do not know if this is an issue that your office has expressed an opinion on, was based on recommendations from several GAO studies and a broad industry labor coalition. That would create a permanent high-level White House IP enforcement coordinator to ensure that the U.S. government approach for attacking IP theft was thoughtful and effective and consistent.

Has your office taken a position on that provision? Are there other aspects of the legislation that you want to share your thoughts on? I think there is a markup anticipated in a couple weeks. I would like to work with you and your office to try to resolve any remaining issues you have over the bill.

Ambassador SCHWAB. Thank you, Congressman. And I commend you, as you know, I did last fall when you were there for the launch of the anti-counterfeiting trade agreement negotiations, for all of your dedication and commitment on issues of piracy and IPR protection.

USTR, as you know, has a very active set of IP related activities, including the cases that we have filed against China, the anti-counterfeiting trade agreement, and the very strong IP protections we negotiated into our free trade agreements.

On the legislation that you mentioned, I am not in a position to comment on the legislation at this time. The Administration is pulling together its official position and I would very much welcome the opportunity to work with you and work with the Committee on the legislation.

We would obviously be concerned by any legislation or any legislation that would call into question the responsibility for developing, coordinating, negotiating U.S. IP protections.

I think we work very well with our fellow agencies as we developed the special 301 report, as we negotiate on these FTAs, as we decide to file cases. And it is a system that works. We stepped up the pace.

And as I said, we would very much like to work with the Committee on those pieces of legislation that may work better than others. And you have my commitment to do so.

Mr. SCHIFF. Thank you. I appreciate it.

The thought is not to inhibit the work that you are doing, but rather you have a very broad portfolio of issues to be responsive to. I think it is the consensus of many in the industry and the Congress that it would be desirable to have someone at a very high level whose primary focus each and every day they get up is dealing with the IP problem and who is at a high enough level within the White House to actually effectuate changes necessary to deal with the problem.

Let me give you one illustration of what we are confronting. You mentioned China. By some estimates, there are more than 225 million internet users in China and a majority of those are downloading and streaming music illegally.

Two recent newspaper articles discussed a China-based internet company called Baidu, which offers illicit music downloading. They are basically a search engine, I guess like Google or whatnot, but one that also lets users listen to and search for songs free of charge.

Roughly nine percent of their traffic comes from the MP3 search. This has helped make them China's biggest search engine, accounting for nearly half of all the queries on the site. This is a company evidently that trades on U.S. markets via U.S. or American depository receipts.

Can you tell us what USTR is doing to confront this company since they are in our market and yet they are becoming one of the major sources of the illegal IP downloading and theft in China? Has your office worked with other Executive Branch agencies regarding the company's activities, particularly given that they trade in the U.S. markets?

Ambassador SCHWAB. We are obviously well aware of the problems posed by Baidu and it showed up prominently last year in our annual special 301 report as one of the notorious markets that we highlighted.

And as you know, we used the special 301 report to set priority targets for the U.S. government, not just USTR, but U.S. government activity related to intellectual property rights violations in our trading partners.

This is an issue that we have raised with the Chinese, in some ways is similar to a problem web site that we are aware of in Russia that we have made some progress on, in fact, and so the answer is, yes, we are working on that, doing that in conjunction with other agencies. And along with a lot of other IP challenges in China, this is very high on our priority list.

Mr. SCHIFF. One of my staff was recently in China, and I participate in a parliamentary exchange with China where we continually raise the IP issue. During my staff member's recent visit, he saw, not that it will surprise you, no diminution of the number of pirated goods in Chinese shops and markets.

A store near the Forbidden City had a sign offering DVDs of "all of the 2008 Oscar winners" and the Hung Chow market in Beijing and New Gardens area of Shanghai were filled with counterfeit goods, including a virtually identical kiosk selling fake iPods.

I think as we have seen in reference to the Olympics, it is not a matter of China's capacity to deal with this problem. Where they have the will to do it, they do very well in dealing with expressions of any kind, let alone pirated music and film.

We run an enormous trade deficit with China where we see that China has the capability and China cannot plausibly make the argument that they are powerless to deal with this problem.

What more can we do? I know we filed the case with the WTO, which is good. Maybe you can share with us the status of that, but also what efforts we can do to make sure China understands we are serious about this and it is going to have trade repercussions.

Ambassador SCHWAB. Congressman, you are absolutely right about the degree of seriousness of the China IP problem. In the last couple years, close to 80 percent of the pirated and counterfeit items that have been seized at the border in the United States came from China.

So it is a topic that is always at the top of our priority list when we are in China. I was there late last month, I mean, just three weeks ago and it was something that I raised with the new Vice Premier who is responsible for the trade and international economic portfolio and with the new Trade Minister.

And the answer is we have a variety of tools that we have and will continue to use through, for example, the JCCT. We have reached an agreement in the past where the Chinese agreed that all computers produced in China would have preloaded operating software. It seems like a small thing. It had a dramatic impact in terms of the sale of the legitimate operating software. We understand that from U.S. software producers. That is one example of sort of a success in a problem-solving approach.

Where we have not been able to get traction, get success in enforcement, and in the case of copyright heavy trade distribution, we now have two cases pending in the WTO, one on enforcement, one on market access related to copyrighted products, which is, you know, music, video, books, reading matter.

We do not like to go to litigation, but we will go to litigation. And the status of those cases is this fall, we would expect to have interim panel findings, early in the fall on the IP enforcement case, later on in the fall on the market access case. And we will continue to pursue those rigorously.

Our objective, though, is to solve the problem, you know, and, therefore, whether it is through law enforcement, and I am sure you are aware last year the FBI and Chinese law enforcement authorities seized half a billion dollars in counterfeit software, there are various successes we can point to, but we know that it is not nearly enough. And, therefore, we continue to ramp up the pressure and ramp up the cooperation that we seek and often get from the Chinese authorities.

We also believe that the Chinese authorities are capable of doing more in this area and we will continue to push.

Mr. SCHIFF. Thank you, Mr. Chairman.

Mr. MOLLOHAN. Mr. Aderholt.

Mr. ADERHOLT. Thank you.

Thank you, Ms. Ambassador, for being here. It is good to see you again and thanks for coming to the Subcommittee for your testimony.

Of course, the issue that you and I have talked mostly about is, of course, the CAFTA issue of 2005. I know that was before you came on board, but you came along right on the heels of CAFTA passing.

And as you are well aware, I supported CAFTA in 2005 after a lot of discussion, especially concerning the sock tariffs and either the phase-out will be gradually over ten years or be maintained indefinitely through a rule of change of origin.

And, of course, both of those sort of have been derailed over the past couple of years. Of course, the sock tariffs disappeared when each country joined CAFTA, as you know, and the rule of origin was never changed.

Back several months, and it may even have been close to a year ago, I think you were kind enough to come here and meet with Senators Shelby and Sessions and myself and two or three other members from other states including North Carolina and Wisconsin. And we talked about this issue.

And at that time, you were talking about working to implement the tariff phase-out. And at the time, you seemed optimistic about that occurring. And I just wanted to touch base with you and see if you are still optimistic and what your thoughts are on that, if you could just share a little bit about that.

Ambassador SCHWAB. Thank you, Congressman Aderholt. I hope your soft sock producers have a sense of what an incredible advocate they have in you here in the Congress. You are right. This is sort of topic number one every time we get together and you have brought—I think I have learned more about socks than any USTR in the history of this organization.

In the letter of July 2005 that my predecessor, Ambassador Portman, and Secretary Gutierrez sent to you, there were five provisions, as you know. And we believe that we have been able to deliver in whole or in part on at least four of them.

We have been less successful in terms of modifying the phase-out, tariff phase-out. But in some ways, the negotiation is being overtaken by the safeguard action, as you know. And we would expect shortly to see the imposition of safeguard on Honduran socks.

Also, you are aware that the special China textile safeguard that was renewed expires at the end of this year. That was also part of the commitment. And our chief textile negotiator, Scott Quesenberry, continues to pursue the other elements in that commitment.

So we have succeeded, as I said, we have succeeded in, we believe, delivering in whole or in part on at least four of the five. And on the last item, the crackdown of transshipment from Asia is an ongoing challenge. But, again, we have made some progress there too.

Mr. ADERHOLT. The concern with the transshipment issue is, do you have the funding available so Commerce is able to do that? I know that is probably more Commerce than your office in particular, but I am sure they give you reports and probably keep you posted on that, or do you feel confident that they are, you know, having the funding to do what they need to do with that?

Ambassador SCHWAB. This is a good example where we work very closely with other agencies to accomplish objectives. Commerce being one. And in this case, obviously Customs and Border Patrol being the lead on this kind of addressing transshipment.

But I will give an example of one of USTR's activities there. We have signed transshipment prevention MOUs with several countries in Asia designed specifically to make sure that those countries do not become vehicles for the transshipment of textile products.

Indonesia. Scott is not here. Indonesia, the Philippines, others, these are countries where we have been concerned about transshipments in the past and have specifically addressed them in dialogue with these countries.

Mr. ADERHOLT. Well, I know that has been the issue with my folks as well. Of course, even with the textiles. But one thing I would like to do is if you could get with the negotiator. You talked about the chief negotiator, Quesenberry. If we could get maybe an update from him at some point. If he could give us an update of how those negotiations are going and let us know.

Ambassador SCHWAB. Absolutely.

Mr. ADERHOLT. As you mentioned, he is working on that. So that would be very helpful so we could have an update to know how those negotiations are in process.

Ambassador SCHWAB. Absolutely, Congressman. Happy to do that.

[CLERKS NOTE.—The information was not submitted for the record before the print deadline.]

Mr. ADERHOLT. Okay. Thank you.

Mr. MOLLOHAN. Mr. Ruppersberger.

Mr. RUPPERSBERGER. Ambassador Schwab, now where were you before your current position?

Ambassador SCHWAB. I was at the University of Maryland.

Mr. RUPPERSBERGER. Oh, so you are a Terp.

Ambassador SCHWAB. I am. I am Terp.

Mr. RUPPERSBERGER. Well, I am from Maryland, too, so I just had to get that in. Okay. That does not mean that I am going to be easy on you now.

Ambassador SCHWAB. I understand, sir. Go Terps.

Mr. RUPPERSBERGER. All right. You said in your statement or opening statement, I was not here, I did not read it, I am not sure if you read it or not, about having trade agreements are really pointless unless you have enforcement.

And what is the Administration's total budget request for your office and how much of that budget is related to enforcement, what percentage?

Ambassador SCHWAB. The fiscal year 2009 request is 46.3 million. And it would be very hard to differentiate between those who are involved in enforcement and those who are not involved in enforcement in the agency.

Enforcement activities really are throughout the agency, Office of General Counsel being the most obvious, but also our Intellectual Property Rights Office. Our China office spends, I would say, the bulk of its FTE's on enforcement issues. Similarly, in some of our services shop on financial services, on other services issues.

So even those folks who are out there negotiating trade agreements frequently are addressing, you know, trying to work through some of the trade barriers that we see as enforcement issues in the context of negotiations. You try to settle disputes sometimes.

So I would not actually, we have never done assessment because it is really——

Mr. RUPPERSBERGER. Well, let us get to what I am really getting to is not the issue of enforcement is important. I mean, you have made that statement.

Ambassador SCHWAB. Absolutely.

Mr. RUPPERSBERGER. It seems to me that the budget that you have here, there is not enough money in there for enforcement. Now, I know you have to protect the President's budget.

But do you feel that you will need more money in order to effectively deal with the issue of enforcement, because that was a strong statement you made? Really trade agreements are pointless if you do not have enforcement.

Ambassador SCHWAB. USTR and I would say the Administration and a lot of the folks we work with in the Administration and other agencies, we feel very, very strongly about enforcement. You have to have enforcement for these agreements to be credible. And we think we do a good job of enforcing them.

One of the challenges that we have had is as you increase the number of trade agreements, whether it is multilateral trade agreements or going from three free trade agreements to seventeen free trade agreements, that obviously increases dramatically the kind of monitoring and enforcement that you need to do.

And particularly in areas such as labor protections and environmental protections that we have built in to the most recent free trade agreements, we will make certain that we allocate within USTR, within our budget whatever we need to meet our enforcement, mandated enforcement obligations.

As I noted in my oral testimony, we know that we can manage within the President's budget request. We also know that if that amount is cut at all, we are in trouble.

Mr. RUPPERSBERGER. Are you familiar with ITAR?

Ambassador SCHWAB. Yes.

Mr. RUPPERSBERGER. And the State Department basically manages the approvals of the sensitive technology sales. I am on the Intelligence Committee. I deal a lot in the area and information that has come to us is that we have some serious issues with ITAR. I think the entire industry has a problem with ITAR.

And really ITAR was really created to protect sensitive technology so that it did not go to other countries, probably China and others. But now it seems that, especially in the European countries, that ITAR is a hindrance not only to our manufacturers and our companies here in the United States, but it can be a hindrance to our national security because literally people are marketing products in Europe as "ITAR free", which means that they are trying to come up with our type of technology to sell it or for components in Europe. And I think it is something that has to be dealt with.

Now, what jurisdiction would you have there? What is your opinion of ITAR? What do you think we need to do?

Ambassador SCHWAB. USTR has no role in ITAR. I am familiar with it. It is one of those areas where like the Administration of the anti-dumping and counter-veiling duty laws or export promotion, you know, formal export promotion, ITAR, these are areas that we are not directly involved in.

We do hear from governments that our export control policies, I mean, we hear from industry and we feed that into the State Department, Commerce Department, Defense Department process.

We are on the CFIUS Group. I mean, so on that, we are part of CFIUS, that Committee, but on ITAR, I would be happy to pass along your thoughts on that to the agencies with jurisdiction.

Mr. RUPPERSBERGER. Because you have such a great background and great educational background and coming from a great school, do you have any suggestions on, from your point of view and what you know now in your job, on how we can really aggressively pursue this issue because it is getting to the point that it really could hurt our country? Any ideas?

Ambassador SCHWAB. When I used to teach this in graduate school at the University of Maryland School of Public Policy where I was Dean, I used to talk about the balance that is necessary. I mean, clearly priority one has to be our national security interests. But having a healthy economy and vibrant technology growth and development and exports are key to our economy.

One of the things I mentioned earlier in my testimony is that even with some bumpiness in our economy today, one of the bright spots is exports and we need to be opening markets for U.S. exports with 40 percent of U.S. economic growth last year attributable to our exports, our export growth.

And so when it comes to export controls, you need to strike the balance. You do want to ensure that you are not letting technologies fall into the wrong hands that could come back and jeopardize our national security but at the same time, you do not want to be in a position of shooting yourself in the foot.

So it is that balance, I think, that is important. And I know that the agencies that administer ITAR, State and others most directly involved are aware of the importance of that balance. It is also sometimes a balance that is hard to strike, as you know.

Mr. RUPPERSBERGER. Okay. I am going to throw you one softball and that is the last question. Do you have an opinion or why do you feel that the trade agreement with Colombia is so important?

Ambassador SCHWAB. I believe the trade agreement—thank you for the question—with Colombia is incredibly important for a variety of reasons. First and foremost, going to the economic issue, the U.S. workers, U.S. farmers, service providers are as dependent, more dependent than ever before on exports.

And what the Colombia FTA does is takes a one-way free trade situation where 92 percent of what Colombia ships to us comes in duty free and makes it a two-way trade relationship. It eliminates the unfairness that our workers, our farmers face with tariffs up to 35 percent in industrial goods, up to and above 80 percent in agricultural goods. And 80 percent of the tariffs on industrial and commercial goods in Colombia would be eliminated on the first day of entering into force of this agreement. So first and foremost, our economic commercial interests. U.S. jobs really are what we are talking about and the advancement of U.S. jobs.

National security, you are on the Intelligence Committee and probably know more than I do about how critically important Colombia is as an ally in a region that is a troubled region at times and that Colombia represents a pro Democracy, pro markets, and pro U.S. country that has made incredible strides in terms of their own progression to more safety, more security.

Mr. RUPPERSBERGER. Especially under the leadership with Uribe.

Ambassador SCHWAB. Particularly under the leadership of Uribe. And that really gets to the third point which is whether the issue is violence in Colombia or narco-trafficking. Since 2002, there has been such a dramatic improvement in the level of violence, in the level of impunity.

And we believe that the free trade agreement will enable those trend lines, those really positive trend lines to continue and that a delay or a voting down of this free trade agreement really risks the progress that has been made.

Mr. RUPPERSBERGER. Do you negotiate or do you communicate with labor?

Ambassador SCHWAB. All the time.

Mr. RUPPERSBERGER. And what is labor's position and how would you answer to labor's position? What is their issue as far as this agreement?

Ambassador SCHWAB. Well, first, as you know, organized labor in the United States as a general matter just opposes trade agreements and I think this has been a really hard agreement for them to oppose because it takes one-way free trade and turns it into two-way free trade, and so the job benefits are very clearly going to accrue to the United States and the stability benefits to Colombia.

Organized labor, the labor leaders I have spoken with have expressed concern about violence toward trade unionists in Colombia and that has been a problem and has been a very severe problem in the past. As you know, the level of violence against journalists, against legislators, against jurists, there are certain groups in that country that have been targeted in the past.

What I think organized labor or labor opponents to this agreement miss is, one, the incredible improvements in the level of violence, the safety and security that President Uribe has brought to that country with a 40 percent decline in the murder rate, an 80 percent decline, I might add, in the murder rate as it involves trade unionists, a dramatic decline, over 80 percent decline in kidnapping, over 75 percent decline in terrorist attacks.

And so from our perspective, if you look at how Uribe has done this, he has set up special protections for union members and others and he has demobilized 40,000 paramilitaries and other guerillas into the broader economy. And for that, the current trade preferences and the free trade agreement are absolutely critical to keep those individuals out of violent pursuits and moved into the legitimate economy.

Mr. RUPPERSBERGER. One more question.

Mr. MOLLOHAN. Sure.

Mr. RUPPERSBERGER. How would not only organized labor, but especially blue collar workers in the United States benefit from this free trade agreement.

Ambassador SCHWAB. Very clear benefits to American workers, American workers and American farmers because the Colombia market has 44 million customers. Right now Colombian products are coming into the United States duty free and U.S. products are facing, U.S. exports are facing high barriers in Colombia.

This agreement eliminates every single one of those barriers to U.S. exports to Colombia which means that the increase in U.S. exports to Colombia that we have already seen would go up dramatically. And we have seen this when we talk to Caterpillar or John Deere or laptop computer producers, Sony television producers making Sony televisions outside of Pittsburgh.

These are all companies that have told us they would expect—Whirlpool is another one—they would expect to be able to increase their exports and, therefore, have a positive impact on their workforce from this agreement.

Mr. RUPPERSBERGER. Okay. Thank you.

Mr. MOLLOHAN. Madam Secretary, following up on Mr. Ruppersberger's line of questioning, in your testimony, you state that these agreements, free trade agreements have been an enormous gain for U.S. farmers, workers, entrepreneurs, and consumers. U.S. exports to the 14 countries with which we have free trade agreements that have entered into force have grown over 40 percent faster than U.S. exports to the rest of the world.

Would you acknowledge that there have been winners and losers in this process and when we are talking about workers, there have been substantial losers in sectors, particularly the manufacturing sectors, and our economy?

Ambassador SCHWAB. It is correct that there are individuals and individual companies and communities that have been negatively impacted by——

Mr. MOLLOHAN. What about whole industries?

Ambassador SCHWAB. There have been industries negatively impacted by trade, but I think when we are looking at the churn in the economy, we need to take into account technological advancements, need to take into account productivity enhancements.

And trade ends up, when you sort of go through the list of changes that affect jobs and the economy, trade and trade agreements ends up being a minute part of it, but it is a part of it and, therefore, programs like Trade Adjustment Assistance have become incredibly important for us to be able to——

Mr. MOLLOHAN. Programs like Trade Adjustment Assistance are inadequate. And I would suggest that if you would acknowledge the significant and severe impacts, industry eliminating impacts of trade agreements and then address the fundamental causes of that, you would advance your cause in getting and acquiring additional support for trade agreements.

I represent an area that is highly dependent on basic manufacturing generally, but principally steel of late, and there have been a lot of industries that have gone by the wayside preceding steel. In the Mon Valley, steel industry is gone many, many years ago. In the High Valley, it is now atrophying to the point of nonviability in certain communities.

So when you talk about the benefits on the one hand, I think you have to, on the other hand acknowledge the extremely negative impacts that trade agreements have caused on sectors of the economy and large geographic areas in the United States. I mean, it is there before us.

And the concern expressed by those who have been defending the interests of these sectors need to be taken seriously and need to be incorporated in these trade agreements if you are going to broaden the support that you have for the agreements.

So with that in mind, what types of products and which sectors benefit the most from these agreements?

Ambassador SCHWAB. Actually, these agreements benefit sectors across the board when we look at manufacturing. U.S. manufacturing exports, for example, have increased over 128 percent since the Uruguay round was negotiated in the 1990s.

Mr. MOLLOHAN. To what extent is that sector specific and what sectors have been benefitted?

Ambassador SCHWAB. It is almost across the board.

Mr. MOLLOHAN. I want you to detail, if you will. Give me some examples of——

Ambassador SCHWAB. Sure. Okay.

Mr. MOLLOHAN [continuing]. Sectors that have been benefited.

Ambassador SCHWAB. Happy to do that. Happy to do that.

Agri-business, earth-moving equipment, tractors, autos, auto parts, electronics, a lot of industrial goods.

Mr. MOLLOHAN. So the automobile industry, you would suggest has been benefited by trade agreements?

Ambassador SCHWAB. The auto sector has, in fact, been benefited by trade agreements.

Mr. MOLLOHAN. What about the steel industry?

Ambassador SCHWAB. Parts of the steel industry have benefited from trade agreements. Parts of the steel industry have had a harder time adjusting to it.

Mr. MOLLOHAN. On balance, how do you measure how that nets out?

Ambassador SCHWAB. Well, if you look, you ask——

Mr. MOLLOHAN. Do you measure? Do you measure how that nets out and do you——

Ambassador SCHWAB. Well, we have a group of economists and it is hard to measure the impact of trade because, for example, U.S. manufacturing output in this country is higher today than it has ever been before in our history. I mean, U.S. manufacturing output goes up. U.S. manufacturing employment has not gone up.

And, therefore, the key question, and I think this really goes to your fundamental question, when we look at trade in the economy, we need to make certain that we have in place the environment within which American workers can remain competitive in an economy where there is constant churn and this has to do with education and it has to do with education and skills. It has to do with portability of pensions. It has to do with healthcare. It has to do with a variety of things.

In terms of a specific way to help individuals, Trade Adjustment Assistance is a more narrowly drawn approach which has, as you know, health benefit components and wage insurance components.

In terms of beneficiaries and the U.S. economy from these agreements, we are looking today at over a $100 billion surplus in trade and services, for example, and these include high skill. These are high-skill services. They are engineering services, architectural services, legal services, that kind of thing.

In agriculture, one out of three is produced for export in this country. So, again, exports has a measurable impact on farm income. And in certain sectors, beef, poultry, pork, you are talking about in some cases half of everything that we produce is being produced for export.

In the Colombia agreement, the tariff, the Colombian tariff on high-quality beef which is currently 80 percent goes to zero immediately upon entering into force. For an industry sector that is now facing higher input prices, that is very, very important.

But on the manufacturing side, recognizing that obviously West Virginia has a large manufacturing base, industrial and consumer goods almost across the board benefit from this trade agreement.

I would be happy to get you a list and we have, I believe, we have state-specific information sheets about benefits for each of the trade agreements and would be happy to provide that specific information to you.

[CLERK'S NOTE.—The information was not submitted before the print deadline]

Mr. MOLLOHAN. And do you have sheets also that show the cost in terms of economic dislocation for those same areas?

Ambassador SCHWAB. Honestly, in the case of the Colombia free trade agreement, because——

Mr. MOLLOHAN. For whatever you have the benefit list, do you have a detriment list?

Ambassador SCHWAB. The answer is yes. In the case of the Colombia and Panama free trade agreements, because both countries have had unlimited access to the U.S. market, virtually unlimited since 1991 or so, we would not expect much of an increase in imports.

In fact, the difference between the 92 percent of duty free treatment that they get now and what they are likely to get, there is a 50,000 metric ton increase in sugar imports, for example.

Mr. MOLLOHAN. Well, let me just say that the reality that the world is increasingly becoming a smaller economic community and that that is a good thing is acknowledged, I think, broadly.

The fact that this has happened in a very precipitous way and that as we have negotiated these trade agreements, we have not taken into consideration the adverse consequences of throwing high standard of living populations, manufacturing populations specifically, against low standard of living manufacturing populations is a reality and has had devastating effects.

Throw in those disparate standard of living populations today, doing it in a very short period of time without, in these trade agreements, negotiating the provisions that would at least in part level the playing field, stretching out the agreements over time, requiring these countries to begin the process of adopting environmental regulatory activity comparable to ours, workplace health and safety requirements comparable to ours and the rights of collective bargaining which we should embrace and promote around the world, our trade agreements have not incorporated these provisions that do create, along with the standard of living disparities, do create a very unlevel playing field.

And I think if we are going to aspire to the Adam Smith principle that the natural advantages of different areas to different sectors of the economy ought to be allowed to work their selves out so that we have the cheapest goods and services provided to everyone and now around the world, then we have to address the artificial disparities that are created by government activity and regulatory enforcement. And that has not been done in trade agreements typically up to this point.

So my question is, with regard to the Colombia free trade agreement, I am giving you an opportunity to speak to that, to what extent are you negotiating in the Colombia free trade agreement these level playing field labor standards: right to organize, environmental requirements, beginning the process of complying at least equally to our standards, and to workplace health and safety requirements which all cost our manufacturing a lot of money and, because they are not incorporated into the manufacturing practices of many of our competitors, do not cost them and, therefore, in and of themselves create the disparities which result in the dislocation of a lot of jobs from the United State to these foreign competitors?

Ambassador SCHWAB. I appreciate what you are saying, Mr. Chairman. And I think some of the issues that you have raised including the question that Congressman Ruppersberger raised are, in fact, addressed in a very unique and very powerful way in——

Mr. MOLLOHAN. Which ones and what are they specifically?

Ambassador SCHWAB. As you know, last May, we reached a bipartisan agreement, the Administration with the leadership here, to include in these free trade agreements enforceable labor and environmental provisions.

So in the case of the labor provisions, what we are talking about is the 1998 declaration of fundamental worker principles and so our worker standards and there are five. One is the right to, let me make sure I get these right, right to organize, right to bargain collectively, the end of forced labor, the end of child labor, and non-discrimination.

So those are in there along with a requirement that both countries, along with a requirement that Colombia enforce its own labor standards which are strong labor standards.

And what we have done for the first time with this level of specificity is made these as enforceable as the commercial elements of the trade agreement, so as enforceable as and subject to the same challenges, dispute resolution, and remedy as the intellectual property rights provisions.

The environmental standards are similar in approach and I know those also have been cited as adding to cost of production in the United States.

Mr. MOLLOHAN. Let us take the environmental standards. What environmental standards have been incorporated into the agreement?

Ambassador SCHWAB. There are two sets of environmental standards incorporated. One is again that Colombia's domestic environmental laws be fully enforced. As you know, many of these countries have labor or environmental standards that are as strong as ours. They just are not necessarily enforced.

Mr. MOLLOHAN. Are you suggesting that Colombia does have environmental standards as strong as ours and they have labor standards as strong as ours?

Ambassador SCHWAB. My understanding, and I can get back to you with the specifics if you need a specific comparison, but my understanding is that Colombia does have on the books strong labor and environmental protections.

The other environmental, again, the new environmental component in this free trade agreement, the Colombia free trade agreement is the addition of a number of multilateral environmental agreements and making those enforceable.

For example, the Endangered Species Act where both the United States and Colombia are signatories of the Marine Protection Agreement. Those are examples of multilateral environmental agreements where Colombia is a signatory. The U.S. is a signatory.

And we are agreeing through this FTA to mutually enforce our participation in those agreements because frequently these are multilateral agreements that sometimes have teeth and sometimes do not have teeth.

Mr. MOLLOHAN. Well, you may not know the answer to this, but my question was, does Colombia have a standard or standards in the area of labor and environmental principles that are comparable to those standards which manufacturers in the United States of America have to comply with?

Ambassador SCHWAB. In large measure, my understanding is that they do. There are going to be differences, for example, in terms of minimum wage and so on. But if I may get back to you with a specific response.

Mr. MOLLOHAN. Certainly. If we had representatives of the environmental community and the labor community sitting at this table asking that same question, would they agree with that answer, do you think?

Ambassador SCHWAB. I would hope so.

Mr. MOLLOHAN. Well, do you know? I mean, you work with this every day.

Ambassador SCHWAB. I do not. I do not know the specifics and I will——

Mr. MOLLOHAN. Well, what are they saying to you? When environmentalists and labor, representatives of the labor community input this issue, what are they saying in this regard?

Ambassador SCHWAB. Well——

Mr. MOLLOHAN. Surely they are and surely you are listening to them.

Ambassador SCHWAB. Oh, yes. Absolutely. In fact, we have as part of our statutory mandate and responsibilities, we have an Environmental Committee that advises us. And we have a Labor Committee that advise us. And——

Mr. MOLLOHAN. My question is, are they agreeing with your assessment which you have just given us here?

Ambassador SCHWAB. If you look at the reports that the Environmental Committee and the Labor Committee have provided on these trade agreements, because they have to provide recommendations on these trade agreements, in the case of the labor group, they have not been supportive of this or, quite frankly, any other trade agreement that our office has ever negotiated.

Mr. MOLLOHAN. Well——

Ambassador SCHWAB. In the case of the environmental group, it is as uneven. It depends on which of the participants.

Mr. MOLLOHAN. Okay. So you have given us very positive thoughts about the quality of the environmental standards and the labor standards which are in effect in Colombia vis-a-vis the United States, but you also acknowledge that there is a lot of opposition from the respective communities, the labor and environmental communities about that.

Ambassador SCHWAB. Those communities were involved in——

Mr. MOLLOHAN. They are not totally satisfied——

Ambassador SCHWAB. Negotiation.

Mr. MOLLOHAN. They do not see it as positively as you see it.

Ambassador SCHWAB. We believe that the provisions, the labor and environmental provisions in these agreements that we worked out with congressional leadership, the Ways and Means leadership and the House leadership, Senate Finance Committee leadership, go a long way to meet the objections.

In fact, I would note that if you look at the positions that labor representatives have taken on trade agreements in general over the last several years, the last ten years, what they have advocated formally on the record be included in these free trade agreements, we did that and more in terms of the Colombia free trade agreement and others. And, quite frankly, the goal posts have moved.

Mr. MOLLOHAN. Well, and that was the point of my question before. You are giving us a very positive assessment of that. And my question was, would they be expressing the same opinion if they were sitting here based upon the input you are receiving from them on a daily basis as you process their input?

Ambassador SCHWAB. I suspect not, but you would need to ask them.

Mr. MOLLOHAN. Well, it is fair. Of course we will. But it is fair for you to have your opinion. I was just asking to what extent you acknowledge that they would have a different opinion.

Mr. Frelinghuysen.

Mr. FRELINGHUYSEN. Thank you, Mr. Chairman.

And following up on the Chairman's comments and Mr. Ruppersberger, I think big labor is opposed to this agreement and I think, as you said in your earlier testimony, just about all the other free trade agreements.

There is a public perception that the Administration and the USTR has not come to the table to address these sort of labor and environmental and workplace condition issues, but in reality, to add emphasis here, that has been done. Now there seems to be sort of another barrier, shall we characterize it as a political barrier, which is perhaps made even more difficult because you have everybody running for President and trying to appeal to their base.

But you have substantially addressed as you have the trade issues a lot of these hot-button issues with the leadership. I think that is somewhat not so subtly referred to in the transmission letter that both Secretary Paulsen and Condoleezza Rice have sent to Speaker Pelosi on Monday.

I want to focus on a paragraph in that transmittal and let me quote it. One of the benefits of travel, and it was bipartisan travel, is to go to Meta and to Cartagena where literally six years ago, it would be a place where few Colombians could live in safety without the potential of being killed, where kidnapings were rife, where the drug lords ran the place. It was no place for foreigners.

In the transmittal letter and I quote, "We take very seriously the importance of timely and effective solutions to concerns regarding labor violence and impunity. The government of Colombia has engaged actively to address these concerns. We have already seen concrete evidence of sustained results. Since 2002, kidnapings are down 83 percent. Homicides are down 40 percent," which you mentioned in an earlier response, "and terrorist attacks are down 70 percent. Homicides of trade unionists declined by over 79 percent between 2002 and 2007. Meanwhile the number of trade unionists enrolled in the Ministry of Interior Injustices Protection Program has increased with more than 9,400 individuals, one-fifth of whom are trade unionists taking advantage of this protection."

My view is, and we discussed this among our congressional colleagues on the trip and on our way back, is a lot of what big labor is operating on is old news. There are horrific things that happen. I assume you would agree and I would like your comments.

Ambassador SCHWAB. You are absolutely right, Congressman, that one of the challenges that we have in selling the Colombia free trade agreement is perceptions that are obsolete. And the tremendous progress that has been made in the decline of violence and impunity since 2002, very, very significant.

And we believe that those remaining concerns, and Colombia continues to be a violent country and we do not imply otherwise, that those remaining concerns are best addressed, and these are concerns of American workers and concerns of Colombian workers, really are best addressed by enacting and implementing this free trade agreement, that delaying the free trade agreement or stopping the free trade agreement is not going to save a trade unionist in Colombia, is not going to create a U.S. job, is not going to save an endangered species.

And so we believe very strongly that the free trade agreement actually contributes to solidifying, locking in the tremendous progress articulated in that letter, solidifying that and putting it on an even, stronger trend line going forward.

Mr. FRELINGHUYSEN. Well, we met with the Colombian Attorney General. We met with a variety of prosecutors, some members of the Judiciary, and prosecutions are up. And, of course, I asked the question, which hopefully was not viewed as an irritant, in a bipartisan way, since the days of former President Clinton, we have substantially invested in what is called Plan——

Ambassador SCHWAB. Plan Colombia.

Mr. FRELINGHUYSEN [continuing]. Colombia. I mean, of all the countries in the hemisphere, Colombia has been the beneficiary, and you would agree, I assume, that we have seen substantial results. We have operatives there from the Drug Enforcement Agency, the FBI, and the ATF. The Department of Justice has basically been a leading agent, not forgetting we respect their sovereignty, in setting up and promoting the rule of law.

There has been a sea change. While there are obviously incidents of violence and the history of paramilitary operations and guerillas doing what they did, people are ever mindful that there has been some major progress. I assume you would agree?

Ambassador SCHWAB. Congressman Frelinghuysen, I agree absolutely. And I would note just as one example the peace and justice law that was passed in 2004 which has facilitated the demobilization.

It also changed their approach to prosecuting from one inquisitorial system to an accusatory system which has helped them to move through the pipeline of outstanding cases.

And, of course, as you have 30, 40,000 combatants demobilized, they are, as part of the demobilization, they are presenting evidence and disclosing information about things, bad things that happened which add to the number of cases that the prosecutors need to address.

And this transformation to an accusatory system means that they are able to move cases through the Judiciary in three months instead of five or eight or nine years.

And so that again has been just a dramatic transformation that, for example, in my conversation a couple weeks ago with the Mexican Attorney General and they are looking at, you know, the challenge of narco-trafficking in Mexico, they are looking at that peace and justice law as a potential model to help them move more cases more rapidly through their judicial systems.

Mr. FRELINGHUYSEN. Talk for a minute about trade agreements with other countries in this neighborhood here. You know, the focus is on Colombia and they have been singularly our greatest ally in support of, and it is a nasty neighborhood to say the least, Hugo Chavez and bullies like him.

What have we done in terms of preferences and trade agreements with countries in the neighborhood that have been willing to negotiate with us, that would somewhat lead to Colombians being bereft. I mean, in other words, we would actually weaken the one ally that we have there.

Paint a picture as to what is occurring in this hemisphere and how important Colombia is in the overall security picture.

Ambassador SCHWAB. I think there are two elements here that bear looking at. One, I think was best articulated by Alan Garcia, President of Peru, when the President signed the free trade agreement implementing legislation late last fall. And he made the point if you look at this region, there are basically two groups of countries in this region.

You have got the pro Democracy, pro markets, generally pro U.S. group, Chile, Peru, Mexico, Colombia, and then you have got the anti markets, anti Democracy, anti U.S. group, Venezuela, Cuba, Bolivia, and others, and that within the near term, countries are going to—Latin America is going to go one way or the other.

I mean, there is one path. There is sort of the populist anti Democratic path and there is the path that is Democracy and freedom and economic freedom and turning away from isolationism whether it is political or economic. So you have got those paths and that is the geopolitics.

The second area, and this was the one that Colombia articulated very clearly when we were down there this weekend, is they are saying, look, you have got a free trade agreement with Mexico, you have got a free trade agreement with Chile, you have got a free trade agreement with Peru, with the CAFTA countries, you would be putting Colombia at a disadvantage relative to other countries in the region if we were to deny or to delay the Colombia FTA.

Mr. FRELINGHUYSEN. It would be inexcusable, it may happen, that we would not act on this.

Thank you, Mr. Chairman.

Mr. MOLLOHAN. Well, there might not be an excuse, but there might be some reasons. With respect to the Colombia free trade agreement, what would be the benefit to Colombia to enter into this agreement if, as you have suggested here, and it has been suggested, if Colombia already enjoys duty free status on most of what it exports to the United States?

Ambassador SCHWAB. Very good question and one that you can imagine I get asked frequently because it seems so obvious that this would benefit U.S. workers and U.S. farmers and service providers and why if Colombia has had 17 years worth of preferences would they want to open their market that way.

One, their own economic philosophy and, as I noted, their ability to continue migrating people from paramilitaries into the legitimate economy, from narcotics into the legitimate economy. So that is one.

What this brings for Colombia in addition to some additional exports like——

Mr. MOLLOHAN. How does that work? I am sorry. Explain that. How does migrating them from the illegal to the legal part of the economy, how does a free trade agreement affect that?

Ambassador SCHWAB. It is the combination of the preferences up to this point and then locking it in and expanding it. So, for example, the stability that comes with knowing this access to the U.S. market is permanent will generate investment and it will generate investment from Colombian entrepreneurs. It will generate, as we have seen it with the Peru FTA, for example, they saw new investment from Brazilian businesses, from businesses in Spain, from businesses in Mexico. Their own entrepreneurs invested more there.

And so what they see is investment in, for example, more flower farms, they ship a lot of flowers to us, significant amounts of our cut flowers, coffee. Again, if you are not sure and you look at the trade preferences we have had to extend, the Congress has voted to extend those trade preferences twice in the last 18 months.

If you have that kind of uncertainty, you are not generally going to put in the kind of long-term investment that you need to build your employment base.

And so President Uribe has been able to turn around that economy. That economy has experienced in the past negative growth. Since he has been in office, they have enjoyed an average of six percent growth. Unless you have that kind of growth, it is impossible to move people from, you know, growing coca into growing other products, you know, flowers as I said, coffee as I mentioned.

It is also not likely that you will see the combatants, the demobilized combatants having the ability to move into new jobs being created.

And in part honestly, Colombia sees this agreement as a way of helping them and we should see it as a way of helping ourselves compete with China and third countries because by giving each other preferential status, Colombia products, for example, will be better able to compete with Chinese products coming into this market. We will better be able to compete for Colombia consumers than our Chinese counterparts.

So to give you a sense of the multiplier effect of this FTA.

Mr. MOLLOHAN. Well, obviously it is a cost benefit analysis and you have done that. And you have just suggested some reasons why Colombia would benefit from the agreement, an expansion of their economy.

On the other side, surely you have done an assessment of what sectors of our economy would benefit and you have suggested some of that.

Have you at the same time done an assessment of what sectors of our economy would be hurt and could you talk about that for us?

Ambassador SCHWAB. Sure. And let me——

Mr. MOLLOHAN. I just need to round this out, and I understand there are going to be some sectors that are benefited. And you are advocating that overall to be positive. And I am just asking what sectors would not benefit, what sectors might be injured in the process.

Ambassador SCHWAB. And, Mr. Chairman, I have been remiss in not having mentioned the International Trade Commission report that is required for every single one of these free trade agreements. So for every one of these free trade agreements, the ITC does a very detailed analytic study about the impact on the U.S. economy, so exactly what you are describing including sector-specific impact.

Mr. MOLLOHAN. Give us some examples of sectors.

Ambassador SCHWAB. In the case of the Colombia FTA, we do not expect there to be any negative impact in terms of the import side simply because our market is already open to Colombian imports.

Now, as I said, there is a little bit of an impact in textiles and apparel. That industry is supportive. There is a little bit of an impact in sugar.

Mr. MOLLOHAN. But what kind of an impact? I mean, when your testimony is on the record and you say there is a little bit of an impact, that could be a positive impact. That could be a negative impact.

Ambassador SCHWAB. I see. Okay. I would——

Mr. MOLLOHAN. What is your testimony here?

Ambassador SCHWAB. Let me suggest that what I need to do is to provide for this Committee and the record the ITC report. Let me do that.

[CLERKS NOTE.—The entire report was submitted for the record and is retained in committee files]

Mr. MOLLOHAN. Okay.

Ambassador SCHWAB. And since I do not have it in front of me, as I recall from that report, there could be some modest increase in imports of textiles and apparel products. We know that that industry is supportive of this agreement, but there could be some modest increase in imports. So it is not necessarily a negative, but describing that.

Mr. MOLLOHAN. When you say the industry——

Ambassador SCHWAB. In the case of sugar——

Mr. MOLLOHAN. Excuse me. When you say the industry, the textile industry is supportive, is that the manufacturing part of the industry?

Ambassador SCHWAB. Correct.

Mr. MOLLOHAN. Is that the owner? What about the labor part of that industry? Are they supportive as well?

Ambassador SCHWAB. I do not know.

Mr. MOLLOHAN. Well, you should know. I mean, that to me is——

Ambassador SCHWAB. I mean, presumably——

Mr. MOLLOHAN. Presumably what?

Ambassador SCHWAB. I am assuming that the labor part of that industry's position is reflected in the Labor Advisory Committee report that we received on the Colombia FTA which is not favorable to the FTA.

You know, quite frankly, when we negotiate these agreements, we are very, very conscious of the impact on U.S. workers. And in the case of the Colombia FTA, it is an overwhelmingly favorable impact on U.S. workers.

Mr. MOLLOHAN. I did not mean to spend so much time on that.

In the steel sector, the USTR worked with the organization of Economic Cooperation and Development, the Steel Committee, the North American Steel Trade Committee, and WTO accession negotiations and with countries bilaterally to focus on steel capacity worldwide and subsidy and other marketing distortions.

The JCCT steel dialogue was launched on March the 4th, 2005. A follow-on meeting was scheduled for late 2006 with industry participants.

Please describe the ongoing work affecting the steel sector. What accomplishments, if any, have been achieved?

Ambassador SCHWAB. In terms of the steel sector, clearly there are challenges associated with global capacity and with increases in construction, a lot of that, and economic growth that we have seen worldwide, a lot of that has been absorbed.

We have been concerned, as you know, with overproduction and overcapacity in China and this has been an area where the JCCT working group has been very actively engaged. It is also an area where I have been personally engaged.

And in the first meeting of the strategic economic dialogue in December of 2006, I used the steel industry in China as a case study for the problems in China's economic industrial policy where they have made sort of an incomplete transition to market economics. And they got overcapacity in steel.

They have addressed it, and this is in part due to our dialogue, in part due to the working group. They have eliminated a lot of their export rebates of value-added taxes. I mean, they are allowed to, under the WTO rebate value-added taxes at the point of export. They are no longer doing that on most, but not all steel products.

So, for example, in my last visit to China, I sat down with my counterpart and identified a couple of products like pipe and tube where they are still rebating the tax and noted that that is creating some dislocation. Aluminum foil is another area.

I do not know how much granularity you are looking for here. But their industrial policy, value-added rebates.

The single biggest accomplishment that I can point to affecting steel vis-a-vis China is the WTO case that we filed beginning of 2007 against a dozen Chinese export subsidies and import substitution subsidies that presumably had an impact across a broad range of manufactured goods because they were generic. They were not sector specific, including the steel industry.

And China settled that case last year, late last year by eliminating every one of those twelve subsidies. That was perhaps the best example that we have of, you know, the combination of problem solving on the one hand and resorting to litigation where necessary on the other.

Mr. MOLLOHAN. Mr. Honda.

Mr. HONDA. Mr. Chairman, I apologize for being a little late here.

And as I walked in, I heard the comment about the effort of the Administration in Colombia working more hard on prosecutions and that over the past few years that there has been an increase in prosecutions. And there was a comment about having visited that area also in that discussion.

So I assume that you have been to Colombia and discussed these things with the Attorney General there and with the President?

Ambassador SCHWAB. Absolutely. In fact, just this weekend had a chance to meet with the Attorney General and the President.

Mr. HONDA. Now, how does a trade agreement affect the ability of the Attorney General to continue and increase his prosecutorial list? I understand they have a big shift and they went from inquisitory to prosecutorial process. I understand that.

But my sense is that that becomes very expensive. And how does the trade agreement impact his ability to move forward and increase his list of folks that he wants to go after?

Ambassador SCHWAB. It has a both direct and indirect impact. I think the most significant direct impact which really we cannot take credit for as part of the FTA because this is something that President Uribe launched when he came into office in 2002, but that has been increasing levels of funding for both the Prosecutor General and for the Judiciary to process these cases.

And one of the challenges they faced, as you know, is with the demobilization of 30,000 paramilitaries, another 10,000 guerillas. With that demobilization and part of their peace and justice law, those individuals have been providing more and more information.

Mr. HONDA. But how does it impact his ability to increase his list of people he wants to prosecute in the way that would bring some justice to those who have been killed? How is that connected to trade or is that part of Plan Colombia? Is Plan Colombia part of the trade agreement?

Ambassador SCHWAB. Plan Colombia and the free trade agreement are separate.

Mr. HONDA. Okay.

Ambassador SCHWAB. However, they are obviously complementary and funding——

Mr. HONDA. So how does trade impact the Attorney General's ability because there is a lot of talk about there is improvement, but improvement means what, going from ten to thirty, and is that pace acceptable? I am just trying to understand why we feel that the trade agreement will effect an increased list of prosecutions.

Ambassador SCHWAB. Most of what is going on in Colombia related to prosecutions is separate and apart from the trade agreement. It is related to President Uribe's commitment to his citizens when he was reelected and the additional funding that he is providing both for prosecutors, for the protection program, and for the Justice system in general.

To the extent that there is a direct relationship with the free trade agreement, it is by creating an environment within which, meaning the stability within which they can see more demobilization is appropriate, where they have the economic growth to sustain the funding that they would continue to provide for this.

Plan Colombia is a very important part of this effort and, as you know, bipartisan initiative launched originally by President Clinton. And part of what we see happening here is for President Uribe and subsequent Colombian administrations to sustain this transformation and sustain, you know, the rapid decline in violence and the rapid uptick in prosecutions and convictions is to move into more self-sustaining capacity to fund these things. And the FTA would help do that.

Mr. HONDA. So it sounds like Plan Colombia should be the mechanism to increase funding for that, for the AG?

Ambassador SCHWAB. If you are asking for direct impact, absolutely, yes sir.

Mr. HONDA. Well, he said he would like to have more because he spends more now on protecting judges, the attorneys——

Ambassador SCHWAB. That is true.

Mr. HONDA [continuing]. And, you know, other folks that are involved in this difficult process. My other question would relate to the fact that 25 percent of Colombia's population are Afro-Colombians. How does this trade agreement help that community and, is it directive? I mean, is there a prescriptive way of having some of that wealth that is supposed to be realized go to certain communities that have heretofore before Uribe even helped create an economic development stimulus for them?

Ambassador SCHWAB. We had a chance to talk about that issue with President Uribe and with one of the Afro-Colombian legislators and the mayor of Cartagena when we were in Colombia this past weekend. The Colombians have, as you know, a growing set of initiatives to address problems faced by Afro-Colombians, including land returns and so on.

And so the capacity of the Colombian government to continue helping bring along the Afro-Colombian population and right some of the previous wrongs is related to or is aided by the stability, the economic stability, political stability, and economic growth that we would see as part of the FTA, you know, one of the results of the FTA.

Again, we are talking about an indirect impact, much as you articulated the Plan Colombia, direct impact and the work of our Justice Department in helping the government of Colombia on the issue of impunity, prosecutions, and convictions.

Again, in the case of the initiatives that President Uribe has underway, particularly in the coastal areas to address challenge, coastal areas around Bogota to address challenges faced by Afro-Colombians, the FTA has an indirect benefit in terms of stability and job creation and economic growth, contribution to economic growth that at the end of the day enables the positive trends to continue and to be sustained.

Mr. HONDA. So last question, Mr. Chairman.

So there is no direct initiative through the FTA that would impact economic development through trade on the population along that coast in terms of infrastructure or economic activity?

Ambassador SCHWAB. Only to the extent that we are talking about increased investment likely to accrue along the coast and the generation of jobs. That would be the most direct impact from the FTA.

Mr. HONDA. Okay. Thank you.

Mr. MOLLOHAN. Thank you.

Do we have any other questions from Committee members?

[No response.]

Mr. MOLLOHAN. Madam Ambassador, there will be some questions submitted for the record and we appreciate your response to those. We very much appreciate your testimony here today. There will certainly be some questions, budgetary questions submitted for the record.

Ambassador SCHWAB. Absolutely.

Mr. MOLLOHAN. And, again, thank you for your service and for your testimony. Thank you.

Ambassador SCHWAB. Mr. Chairman, thank you very much, members of the Committee.

[Questions and answers sumitted for the record follow.]

Questions for the Record and Responses from Ambassador Susan Schwab, United States Trade Representative

Hearing before the House Appropriations Committee, Subcommittee on Science, the Departments of State, Justice and Commerce, and Related Agencies, April 9, 2008

Representative Mollohan

The 2009 USTR budget includes an increase of $2.1 million, just under five percent of the FY 2008 appropriation. However, this is just equivalent to USTR's fiscal year 2008 spending level, which allowed USTR to spend $2.2 million in no-year carryover funds in addition to the enacted level of $44.1 million.

Indeed, your justification makes it quite clear that $46.3 million—the President's request—is not enough for fiscal year 2009, in part precisely because USTR will have exhausted all of its no-year carryover funds in fiscal year 2008. The justification states that *"This will be a challenge to USTR management."*

On page 23 of the justification, USTR lists its fiscal year 2009 **Budget Risks**. Included on this list—but not in the budget—are:

1. A WTO Ministerial, normally scheduled bi-annually, which has not been assumed in this budget due to the current stage of DOHA negotiations;
2. Capital security costs in China related to the State Dept's global embassy construction program that have not yet been charged to USTR despite the fact that it has been in Beijing since 2007;
3. The need to strictly control personnel costs through deliberately pacing hiring requirements; and
4. A new lease for the Ambassador's residence in Geneva.

Question 1
Ambassador Schwab, this budget was developed some time ago and we heard from your office that the DOHA round was heating up. Please update us on the DOHA negotiations, and explain how this affects the need for a WTO Ministerial. The risk was calculated as $1 million plus. Just how risky is the exclusion of this budgetary item?

Answer
The Doha negotiations have recently intensified, particularly in the three core areas of agriculture, non-agricultural market access (NAMA), and services. The United States and other participants have been working intensively with the NAMA and agriculture negotiating group chairs to develop revised texts that senior officials and ministers will use as the basis for negotiations on formulas for cutting tariffs and reducing agricultural subsidies. The services discussions have concentrated on preparing a text to frame the next stage of the negotiations. We anticipate that as senior officials and ministers work on agriculture and NAMA, negotiators will also hold a "signaling meeting" in which key participating WTO Members will provide a

better sense of the services commitments that would be achieved in a successful round. Each of these efforts is aimed in the short term at producing formulas and frameworks that will allow the overall negotiations to enter the final stage of work.

We expect that the convening of a major WTO ministerial conference will depend on the progress that is achieved in the Doha negotiations. For large-scale meetings like the ministerial conference held in Hong Kong, significant advance planning – in the range of six to twelve months – would be required to accommodate 152 WTO Members and upwards of 10,000 participants. A ministerial on this scale is not currently on the horizon, but this does not mean one will not be held in FY 2009. We expect smaller scale ministerial meetings to be held, however, such as one anticipated in June in Geneva to make progress in the three core negotiating areas. Meetings of this size require fewer participants and resources and we expect that our outlays for a meeting of this nature would not exceed $0.1M.

Question 2
USTR has been in Beijing since 2007, but no capital security costs have yet been charged. Has USTR been in contact with State about a possible range? Do you not have any idea how much these costs might be? How often are these costs charged? How much time will USTR have to pay the costs once State charges them?

Answer
The State Department assesses capital security costs annually on a per capita basis. The charges are determined in part by whether the person works in a controlled access area or not. We have three people on staff (one USTR and two locally hired) in Beijing who will be moving into the new embassy once completed. Our estimate is that the total cost will be about $60K/year based on our current staff of three. The assessment is normally paid in its entirety during the first half of each fiscal year. It is likely that costs will increase over time even at a constant staffing level due to increases in construction costs and other requirements determined by State Department globally. The embassy is scheduled for completion later this year.

Question 3
On page 12 of the justification, we find that despite static FTE levels, *"the current budget request will not permit USTR to sustain this level of staffing."* As a result, USTR plans to slow hires or not backfill vacancies, increase the number of un-reimbursable detailees, and reassign personnel based on mission priorities.

(1) Based on the workload, what is USTR's real FTE need?

Answer
USTR's staffing requirements are largely driven by the trade mission agenda and the necessary monitoring and enforcement effort. There has been growing attention given to China, M&E activities and intellectual property issues, among others. Achieving these goals for the U.S. Government while staying within budget requires making trade-offs against lower priorities. While an increase in personnel would allow us to devote more time to more issues, we must still focus our resources on those items that are highest priority.

(2) What will the actual FTE level be, should this budget be enacted?

Answer
FTE will be lower, but it is difficult to forecast an exact number with certainty given that other expense components of our budget are uncertain. Some aspects will likely increase, especially international travel costs, language services, Federal Protective Services, capital security costs and ICASS. We believe that about an 8 FTE reduction is probable.

(3) Which missions will be placed on hold, and which will be scaled back as a result of this budget level?

Answer
That determination will be made based on the priorities of the next Administration. Our focus will likely remain on completing the Doha round negotiations, opening up closed markets for U.S. beef, upgrading intellectual property enforcement in both developed and developing countries, and ensuring that bilateral and multilateral agreements currently in force are appropriately monitored and enforced, that recently approved agreements are implemented properly, and that pending agreements are approved.

(4) Since S&E is 79 percent of USTR's budget, what effect would a long-term CR have?

Answer
A long-term CR would require USTR to undertake major cost-cutting measures. As we have indicated, we have been able to manage this fiscal year without undertaking such measures because we can draw from $2.2 million carried over from prior years to supplement our $44.1 million appropriation. Given the structural COLA increases in payroll, increases indexed to inflation for services including security, language services, etc., State Department assessments for ICASS and the capital security cost program, rapidly rising travel costs, and the weakened dollar, USTR will need to take dramatic steps to reduce payroll to offset the shortfall a CR would create. This would likely mean a reduction in FTEs to fewer than 210.

Question 4

The travel budget has been increased slightly, but given the increasing costs of fuel and lodging costs and the fluctuations in the value of the dollar, $100,000 will not go far. How will this budget affect travel? What efficiencies have you put into place?

Answer
We have utilized video teleconferencing (VTC) as a communications medium to reduce travel where possible. It will never be a total replacement, but will continue to be helpful. In the past few years, we have supplemented or otherwise offset our travel budget by an average of $2M through judicious use of VTCs. At the beginning of each FY, we set out overall allocations for personnel, travel, other services, communications/IT, facilities, etc. based on our available funds. Next we allocate individual travel budgets to each of our 27 offices based on its described priorities as driven by USTR's performance plan. In executing these budgets, each office manager sets priorities regarding which travel to fund and at what level. To stretch travel funds,

managers may elect to include fewer subject matter experts on a particular trip, to combine the responsibilities of those traveling, and to arrange back-to-back country visits.

Question 5
The lease on your residence needs to be renegotiated or a new residence will have to be located. Given the value of real estate in Geneva, this could increase USTR's presence in Geneva by as much as 50 percent. The risk associated with this is $100,000. What is the status of the lease? If the lease increases, where will the funds come from?

Answer
The lease issue has been resolved. Our Geneva office had been searching for a new residence for more than a year and located a new residence which will actually generate some modest savings after consideration of all operating costs for the residence in addition to the lease. We have a five year lease, which provides some certainty for the foreseeable future, and the location has better proximity to the Geneva mission. There were some one-time upfront costs associated with the relocation, which USTR is funding in FY 2008, and some additional security enhancements that will need to be funded in FY 2009.

Question 6
USTR's budget says the request level will affect its ability to fund IT projects and upgrades for DC and Geneva offices. Yet the Executive Office of the President assumed responsibility for USTR's IT systems, operations and maintenance in fiscal year 2004. What types of upgrades and projects are unfunded? What is the level of risk?

Answer
The Executive Office of the President (EOP) provides substantial but limited IT support to USTR. The EOP is responsible for providing computer services for USTR's PC desktops for unclassified work, network servers and support, and landline telephone and communication costs. USTR funds its own hand-held (Blackberry) equipment and communications costs, desktop equipment for classified information, printers, copiers, fax machines, audiovisual equipment, knowledge management improvements, etc. USTR has deferred from FY 2008 certain IT projects, totaling about $0.3 million, designed to increase office efficiency and mission effectiveness. If sufficient funds are not available in FY 2009, we will not be able to undertake another $0.3 million in projects planned for that year either. Not funding these projects will limit our progress in providing mission enhancements and improving our working environment.

Deferred from FY08 Budget	Est. Cost ($1000)
Training & conference rooms audiovisual improvements	50
Web Site redesign/upgrade	50
Wireless remote access for laptops	50
New secure cell phones	30
White House TV connectivity	10
Desktop DVC endpoints	30
Geneva document scanning project	100
Total FY 2008 projects deferred	320

FY09 Projects	
Interface to State Dept SDVC Cloud	30
New computer flooring IT spaces	30
Two Maxwell Secure Voice Systems	40
Replace Xerox Document Centers	120
Xerox Docushare wide-scale implementation	50
Total FY 2009 projects deferred	270

CHINA WTO COMPLIANCE ISSUES

Question 7

The last time USTR appeared before this Committee was February 16, 2006. At the time Ambassador Portman said about China that "getting into the WTO and being a big developing country with a lot of deep, deep poverty, they have not been treated up to now as a full, mature trading partner. It is time for that to happen." The February 2006 Top-to-Bottom review of trade with China concluded that the relationship lacked equity, balance, and durability.

Since then, USTR created the position of Chief Counsel for China Trade Enforcement and set up its office in Beijing to implement the China Top-to-Bottom review recommendations and to more efficiently and effectively allocate enforcement resources.

(1) What is USTR's strategy for resolving WTO compliance issues with China?

Answer

The United States places a strong emphasis on China's implementation of its WTO commitments and adherence to WTO rules. Almost all of the specific commitments that China made when it acceded to the WTO on December 11, 2001, were due to be implemented over a period of five years, ending about 18 months ago. Accordingly, the United States has been working to hold China fully accountable for meeting the WTO rules they have agreed to.

The focus of this bilateral and multilateral engagement includes work to eliminate significant market impediments and trade-distortive practices as well as other Chinese government policies and practices where fundamental WTO principles are at stake.

The United States has intensified its bilateral engagement with China. In 2007 and 2008, the United States leveraged numerous formal and informal bilateral dialogues and meetings, including working groups and plenary meetings held under the auspices of the U.S.-China Joint Commission on Commerce and Trade (JCCT) and the U.S.-China Strategic Economic Dialogue (SED). Through these avenues, the United States continues to seek resolutions to particular pressing trade issues and encouraged China to accelerate its movement away from reliance on government intervention and toward full institutionalization of market mechanisms.

The United States has also taken enforcement actions at the WTO in key areas where dialogue has not resolved our WTO-related concerns. These have included a dispute challenging China's discriminatory taxes on semiconductors, which China settled to our full satisfaction during WTO consultations. We also have brought a dispute challenging China's discriminatory charges on imported auto parts, and press reports have noted that the United States obtained a highly favorable interim panel decision. We are eagerly awaiting the public version of the final panel decision this summer. In addition, U.S. preparations to bring a dispute challenging a Chinese antidumping decision against industrial paper products led China to withdraw the problematic decision on the day before the case was to be filed.

In 2007, the United States brought three more WTO cases against China, and in 2008 one additional case. One of the 2007 disputes involved a challenge to Chinese export and import substitution subsidies, which are prohibited under WTO rules. In late November 2007, China agreed to resolve all the U.S. concerns by settling the case and eliminating all the challenged prohibited subsidies. The second 2007 dispute challenges deficiencies in China's legal regime for IPR protection and enforcement, and the third case challenges China's barriers to the import and distribution of publications, movies, home videos, and music. The 2008 dispute concerns China's restrictions on foreign financial information service suppliers. These three cases are being pursued vigorously through the WTO dispute settlement process.

We will continue to actively press China to meet its obligations, both through bilateral engagement and the use of WTO dispute settlement where it is appropriate.

(2) What new WTO dispute settlement challenges has USTR initiated with respect to China's prohibited subsidies?

Answer
With the creation of the position of Chief Counsel for China Trade Enforcement, we initiated a dispute against China in February 2007 on import substitution and export subsidies we had found that China did not eliminate upon accession as it had agreed to do. These subsidies were maintained contrary to an explicit WTO prohibition. Mexico subsequently filed a similar case, and together we later established a WTO dispute settlement panel in August 2007 to hear the case after our joint consultations failed to resolve the dispute. Last fall, China agreed to settle the case by eliminating all the prohibited subsidies no later than January 1, 2008. We have been carefully monitoring China's implementation of these commitments and have detected no problems to date.

(3) Please describe USTR's actions with respect to China's market access barriers to US publications and audio-visual materials.

Answer
On April 10, 2007, the United States requested WTO dispute settlement consultations with China concerning certain Chinese measures that appear to be inconsistent with various WTO obligations of China. This consultation request focused on a Chinese legal structure that denies foreign companies the right to import publications, movies, music, and videos, that severely impedes foreign companies from participating in the distribution of publications, music and videos within China, and that disadvantages the distribution in China of imported publications, movies and music vis-à-vis their domestic counterparts. As the United States and China were

unable to resolve this dispute in these consultations, the United States filed a request for the establishment of a WTO panel on October 10, 2007. A WTO panel was established to examine this matter on November 27, 2007, and was composed on March 27, 2008. The first panel meeting is expected to take place in July of 2008. A separate WTO dispute against China, also underway, will likewise improve market access for these products. This dispute challenges deficiencies in China's legal regime for IPR enforcement and protection that create opportunities for pirates to take over markets from the legitimate copyrighted products.

(4) How has USTR's focus on China impacted USTR's workload?

Answer
USTR has not hesitated and will not hesitate to enforce China's WTO obligations when warranted and has a variety of means at its disposal to gather the necessary information and resources. In addition to China Office personnel, USTR draws on numerous attorneys from its General Counsel's Office, including the Chief Counsel for China Trade Enforcement. In addition, many others at USTR participate in compliance matters as the need arises. They include USTR policy and legal experts on issues such as intellectual property rights, services, investment, technical barriers to trade, customs administration, import licensing, rules of origin, information technology, tariffs, subsidies, agriculture, and sanitary and phytosanitary barriers. In addition, USTR's representatives in Geneva participate in various WTO meetings and reviews addressing the compliance efforts of China, among other WTO Members. At the same time, several other agencies also devote substantial resources to day-to-day WTO compliance monitoring activities. They include the Departments of Commerce, State, Agriculture and Treasury, both through personnel in Washington and on the ground in China. Finally, USTR requires cooperation and support – particularly in terms of information – from interested U.S. industry to ensure we have the information necessary to pursue any relevant issues or cases.

(5) How does USTR's local presence increase its effectiveness in China?

Answer
The addition of USTR personnel at the U.S. Embassy in Beijing, including a new Minister Counselor for Trade Affairs, has significantly increased USTR's effectiveness in pursuing priority U.S. trade policy interests in China. USTR's Minister Counselor for Trade Affairs has been working closely with Embassy staff from other agencies and with the U.S. business community resident in China to help prepare for and conduct trade negotiations and dialogues, and to help support other U.S. government trade policy initiatives in China.

(6) Has China commenced formal negotiations to join the WTO's Government Procurement Agreement as it agreed to, by December 31, 2007?

  a. What effect will China's joining have?

Answer
China commenced formal negotiations to join the WTO's Government Procurement Agreement (GPA) on December 28, 2007, through the submission of its initial Appendix I offer, which sets out the procurement it proposes to cover under the GPA. We are seeking substantial

improvements in China's offer to bring it to the level of the procurement covered by the United States and other GPA Parties. When China completes the GPA accession process and will provide U.S. goods, services and suppliers with reciprocal access to Chinese government procurement, the United States will lift the current purchasing prohibition that generally prohibits federal agencies from purchasing goods and services from China.

(7) USTR's justification says that it has brought four formal WTO cases related to China's trade practices in the last 22 months. Were any of these pursuant to Section 421?

   a. What was the ITC decision?

   b. Has the President denied appropriate relief in any of these cases? Are there clear indications that he is going to deny relief?
   c. What was your recommendation on those cases?

Answer
Section 421 provides for trade remedy proceedings designed to address market disruption caused by imports from China. A proceeding under Section 421 is conducted by the U.S. International Trade Commission and USTR, with the final decision being made by the President. It does not involve the WTO. Consequently, none of the WTO cases brought by the United States against China have involved Section 421. Accordingly, for these WTO cases, the Section 421 procedures, including requirements for decisions by the ITC and the President, were not applicable.

Question 8
Section 421 Protects against market disruption due to Chinese imports.
1. Product imported must in such increased quantities or under such conditions as to cause or threaten to cause market disruption.
2. Market disruption exists when imports are increasing rapidly, either absolutely or relatively, so as to be a significant cause of material injury or threat.
3. Significant cause is a cause which contributes significantly to the material injury but need not be equal to or greater than any other cause.

(1) Please describe the status of other commitments China made and USTR reported in 2006, including:

   d. the elimination of duplicative testing and certification requirements applicable to imported medical devices;
   e. adjustments to its registered capital requirements for telecommunications service providers;
   f. and allowing the resumption of trade in US beef and beef products.

Answer
The status of these commitments is as follows:

With regard to medical devices, China committed at the April 2006 JCCT meeting to eliminate duplicative certification requirements applicable to imported medical devices. Initially, China only took steps to address duplicative product testing, without addressing the burdensome duplicative factory audits and certification requirements applicable to imported electro-medical equipment or additional product-specific concerns, such as redundancies on border inspections for imported pacemakers. In fact, in June 2007, China added a layer of redundancy with Decree 95, issued by the State Administration of Quality Supervision and Inspection and Quarantine (AQSIQ). The United States raised its concerns regarding the barriers to medical devices in a series of bilateral meetings in 2006 and 2007 as well as during meetings at the WTO. The United States also pursued China's full implementation of this commitment during the run-up to the December 2007 JCCT meeting. At that meeting, China agreed to take action to eliminate remaining redundancies in its testing and certification requirements for imported medical devices, and committed to implement a "one test, one fee" policy, establishing a single conformity assessment system for medical device testing.
China also agreed to suspend implementation of AQSIQ Decree 95, a regulation that would have produced additional testing and inspection redundancies targeted exclusively at imported medical devices.

With regard to telecommunications capital requirements, even though China specifically committed at the April 2006 JCCT meeting to make appropriate adjustments to its registered capital requirements for providers of basic services, to date it has not made any adjustments. The United States has continued to raise this issue in bilateral meetings, including subsequent JCCT and SED meetings. In the latest JCCT meeting, held in December 2007, China reiterated its intention to reduce its registered capital requirements. We are monitoring this situation closely and continue to press China to honor its JCCT commitment.

With regard to U.S. beef and beef products, China's market continued to be closed to U.S. beef and beef products in 2007 because of China's BSE-related ban, even though China still has not provided any scientific justification for continuing to maintain its ban. In May 2007, the United States received a risk classification as a "controlled risk" country by the OIE, indicating that all U.S. beef and beef products are safe to trade, provided that certain risky materials are removed during processing. Later that month, while in Washington for the May 2007 SED meeting, then-Vice Premier Wu Yi offered to open China's market to both boneless and bone-in beef, although with an age restriction of 30 months or less. The United States rejected this offer because the applicable OIE classification has no age restrictions. Since then, U.S. and Chinese officials have met repeatedly, but to date China has not indicated a willingness to begin accepting U.S. beef and beef products into its market in a manner consistent with the OIE's classification. We will continue to press China on this issue until it is satisfactorily resolved.

(2) Please describe the favorable settlements that USTR reached with China, with respect to the elimination of a dozen export and import substitution subsidies.

Answer
As a result of the dispute we brought against China, we were able to negotiate a highly favorable settlement in a Memorandum of Understanding (MOU) in November 2007. Under this MOU, China committed to eliminate, by January 1, 2008, all of the prohibited subsidies we had challenged in the dispute. China also committed not to reinstate any of these subsidies and not to provide import substitution or export subsidies in the implementation of its new tax law after January 1, 2008. As a result of these commitments, we were able to receive the same favorable outcome we would have received through litigation, but significantly sooner.

We have since been closely monitoring China's actions to ensure that China complies with its commitments under the MOU. Our review indicates that so far China has complied with those commitments.

TRADE GAP WITH CHINA

Question 9
In 2007, the US trade deficit declined 6.2 percent to $711.6 billion after setting records for five consecutive years. The deficit is nearly double what it was in 2001.

The trade deficit with China continued to rise, jumping 10.2 percent to $256.3 billion and passing Canada to become the US' largest source of imported goods. It is also the largest gap ever recorded with a single country.

In January 2008, US exports rose 1.6 percent to a record $148 billion, thanks to the weak dollar. But imports from China rose nearly two percent and US exports to China decreased 15.1 percent.

- How does China's tightly managed foreign exchange rate factor into the trade imbalance?
- Does this enter into trade negotiations? How?

Answer
Many factors affect the United States', China's and other countries' bilateral and overall trade balances, including relative rates of economic growth, patterns of saving and investment, the pattern of comparative advantages in trade, domestic price levels and exchange rates.

The core mission of the Office of the U.S. Trade Representative is to seek the enhancement of U.S. prosperity by pursuing free and fair access to markets around the world for our exports. Trade policy and negotiations are primarily concerned with reducing or eliminating trade barriers and practices that protect or promote specific sectors or products, such as import quotas, tariffs, export subsidies and discriminatory or protectionist regulatory measures. The Department of the Treasury, in contrast, is tasked and best equipped to handle the macroeconomic issues, including exchange rate policy, that affect trade balances through its extensive dialogue and engagement with our major economic partners.

Question 10
Previously the President denied relief for a Section 421 decision with respect to pipe material, based in part on the premise that Chinese imports would have been curtailed by 50 other countries ready to replace them.

Does the fact that the trade gap with China is widening and the trade gap with other countries is narrowing factor into such a decision? Is there any concern that the extent of China's exports will eventually overwhelm the ability of other countries to compete?

Answer
In December 2005, following interagency consideration of the U.S. International Trade Commission (ITC) determination of market disruption, the President determined that imposing import restrictions in the Section 421 steel pipe investigation would not be in the economic interest of the United States. The President found that import relief would be ineffective, because of the extent to which imports from third countries would likely replace curtailed Chinese imports. Also, the President noted that the quota remedy recommended by the ITC would have generated costs for U.S. consumers five times greater than the additional income that could have been realized by domestic producers. It is also noteworthy that, throughout the period investigated by the ITC, the domestic industry was able to raise its prices and remain profitable.

Although the President determined that relief under section 421 was not in the national economic interest in this case, the Administration has and will continue to provide relief where warranted and consistent with our trade laws. Last year, for example, U.S. standard pipe producers filed petitions seeking AD/CVD relief for imports of these products from China. The Commerce Department has made preliminary findings of both dumping and subsidies in these investigations. In addition, in 2007, the United States brought a WTO dispute against China challenging China's prohibited subsidies, which were benefiting a wide range of industries in China, including the steel industry. We successfully settled that dispute in November 2007, based on China's commitment to eliminate all the prohibited subsidies we had challenged effective January 1, 2008. USTR has also pressed China vigorously in bilateral discussions to eliminate differential tax policies favoring the exports of certain steel products such as pipe.

There is increasing concern in many countries about the import surges from China. Indeed, one of the challenges to the industrial tariff negotiations in the Doha Round has been concern by many developing countries about imports from China.

INTELLECTUAL PROPERTY RIGHTS

Question 11
In October 2007, GAO testified before the House Judiciary Subcommittee on Courts, the Internet, and Intellectual Property. GAO found that U.S. intellectual property is increasingly at risk as U.S. firms become more integrated into the world economy and the production of more sophisticated processes and investments move overseas. It is USTR's to lead with respect to

trade policy initiatives to increase IP protection and enforcement. In fact, USTR put China on its Special 301 Priority Watch List in 2005 and China remains subject to Section 306 monitoring. But USTR has taken other actions, including a special provincial review.

(1) Please explain the nature and effect of the provincial review.

Answer

In 2006, USTR announced that it would conduct an unprecedented special provincial review of China, the results of which were first reported in the 2007 Special 301 Report. USTR's increased focus on the adequacy and effectiveness of IPR protection and enforcement at China's provincial level continued during 2007 and early 2008 and is reflected in the detailed reporting on selected key provinces and province-level cities in this year's Special 301 Report.

The purpose of this portion of the Special 301 Report is to assess the adequacy and effectiveness of IPR protection and enforcement at the provincial level, and to spotlight strengths, as well as weaknesses and inconsistencies, in and among specific jurisdictions within China. This special focus enables us to spotlight IPR issues not only in terms of the vast expanse of China as a whole, but also to identify specific challenges, opportunities, and trends in particular geographic areas. For example, the 2008 Special 301 Report:

- Points to particular cities and markets that are associated with counterfeiting of certain goods, such as fashion, jewelry, sports, apparel, health care, and automotive products.
- Highlights emerging trends, like increasing Internet trafficking of counterfeit apparel in Guangdong Province, or the migration of infringers toward less-developed northern parts of Jiangsu Province.
- Credits notable positive efforts of local authorities in some areas, such as Shanghai and the port of Xiamen.

The effect of the provincial review has been to call the attention of Chinese provincial and local authorities to challenges that are particular to their provinces and local jurisdictions, and thus to foster a sense of responsibility and encourage positive actions at the provincial and local levels. Although the increased focus on the provincial and local levels is still relatively new, U.S. Government interactions with officials at those levels suggest that it is starting to contribute to greater awareness at those levels of problems that specifically concern the U.S. Government and U.S. right holders.

In its February 2008 Special 301 submission, the National Association of Manufacturers (NAM) encouraged continuation of this increased focus. NAM said the information in the 2007 provincial review was "very helpful" to U.S. industry, and said the report "can also act as incentive to provinces to maintain high standards for IP enforcement to attract foreign investment."

In addition to an increased focus on provincial issues, USTR has taken a number of other actions to increase IP protection and enforcement in China. For example, USTR has initiated a WTO dispute challenging inadequate IPR enforcement measures maintained by China, and another dispute challenging Chinese barriers to market access for goods and services involving copyrighted products such as movies, publications, DVDs, and CDs.

> (2) Has USTR followed GAO recommendations to set annual measurable predetermined targets related to its China compliance performance measures and assess the results in its annual performance reports? Where is USTR in this process? What targets have been set and what are performance results to date?

Answer
By statute, USTR is required to submit annual reports to the Congress on "compliance by the People's Republic of China with commitments made in connection with its accession to the World Trade Organization, including both multilateral commitments and any bilateral commitments made to the United States." (See 22 U.S.C. § 6951.) Pursuant to this requirement, USTR submits annual reports to Congress that comprehensively describe not only China's WTO commitments and the efforts that China has made to comply with those commitments, but also the Administration's efforts to secure China's compliance where China has not fulfilled its commitments, utilizing a common template in which the relevant information is presented from year to year. These reports address the range of WTO compliance issues, including those arising in the area of intellectual property rights. Readers of the reports have confirmed the comprehensiveness and fairness of the information provided in them. At the same time, USTR is exploring how to include more quantitative measurements in the reports, taking into account the inherent limitations and difficulties involved in accurately quantifying this type of subject matter, our shared goal of not having a quantification and reporting structure that makes it more difficult to achieve substantive progress, and the most effective deployment of resources.

In addition to its annual reports on China's WTO compliance, USTR also issues annual Special 301 Reports. The China section of USTR's Special 301 Report is by far the most comprehensive description of the challenges faced by U.S. right holders of any country listed in the Report. In both the overall narrative section, as well as the section on provincial and local issues, the report provides detailed information gathered from a variety of sources, such as U.S. right holders and Chinese authorities. This especially detailed reporting on China provides a means to track progress and ongoing challenges in confronting intellectual property challenges of various kinds in China.

> (3) GAO's testimony says that overall piracy and counterfeiting levels remained unacceptably high in 2006 and key concerns are books, journals, and business software. What USTR efforts are underway to combat this?

Answer
As detailed in this year's Special 301 Report, while there have been some instances of improvement, the overall situation with respect to piracy and counterfeiting in China remains at unacceptably high levels.

The 2008 Special 301 report states that piracy of books and journals and end-user piracy of business software remain key concerns. The Report calls upon China to take more aggressive action to prosecute entities engaged in commercial reproduction of pirated books, journals, and periodicals. The Report details challenges faced by book and journal publishers with respect to large scale infringement on school and university campuses in several of the provincial/municipal summaries. It also describes instances of proactive steps taken by Chinese authorities to address these challenges. With respect to business software, China is making progress on implementing its 2006 Joint Commission on Commerce and Trade (JCCT) commitment to ensure that computers are pre-installed with legitimate operating system software. However, the end-user piracy of business software remains a serious concern in China.

These are just two instances of the many industries and sectors affected by high levels of IPR infringement experienced in China. USTR continues to press China to improve its protection and enforcement of all forms of IPR using the full range of trade policy tools.

For example, the United States has pursued dispute settlement through the WTO to address deficiencies in China's IPR protection and enforcement regime that contribute to these problems. In April 2007, the United States secured WTO dispute settlement consultations with China over deficiencies in China's legal regime for protecting and enforcing copyrights and trademarks on a wide range of products. After those consultations failed to resolve the matter, on August 13, 2007, the United States requested the establishment of a WTO panel. The panel proceeding reflects U.S. concerns that certain Chinese measures are inconsistent with China's obligations under the TRIPS Agreement. The panel proceeding focuses on three main issues: 1) quantitative thresholds in Chinese law that must be met in order to start criminal prosecutions of copyright piracy and trademark counterfeiting and that appear to create a substantial safe harbor for those who manufacture, distribute, or sell pirated and counterfeit products in China; 2) rules for disposal of IPR infringing goods seized by Chinese customs authorities; and 3) the apparent denial of copyright protection to works that are awaiting or have not received Chinese censorship approval. A WTO panel was established to examine this matter on September 25, 2007; panelists were appointed on December 13, 2007, and briefing is underway.

(4) Is USTR coordinating with other federal agencies?

Answer
USTR coordinates with many other federal agencies in its efforts to address the challenges of protecting and enforcing IPR in China. As described in the "2008 Report to The President and Congress on Coordination of Intellectual Property Enforcement and Protection",[1] USTR, along with many other federal agencies, is working in a coordinated fashion to improve the IPR environment in China. This includes engagement through the JCCT, the Strategic Economic Dialogue (SED) and other fora.

(5) What Intellectual Property rights commitments has USTR negotiated with China at the Joint Commission on Commerce and Trade (JCCT)?

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[1] Available at http://www.stopfakes.gov/pdf/2008_NIPLECC_Report_and_Appendices_Final.pdf

Answer
In the past several years, USTR and the Department of Commerce, as co-chairs of the JCCT, have negotiated a number of IPR commitments with China. For example:

- China agreed to introduce rules that require computers to be pre-installed with licensed operating system software;
- China agreed to step up work to combat counterfeit goods at trade fairs and consumer markets;
- China agreed to increase the number of criminal prosecutions for IPR violations relative to the total number of IPR administrative cases.
- China committed to accord technology-neutral treatment to different third generation (3G) wireless technology standards.
- China agreed to join the WIPO Internet Treaties, which are critical to ensuring IP protection in the digital age.
- China and the United States agreed to exchange information on customs seizures of counterfeit goods in order to further focus China's enforcement resources on companies exporting such goods.
- China agreed to strengthen enforcement of laws against company name misuse, a practice in which some Chinese companies have registered legitimate U.S. trademarks and trade names without legal authority to do so. The two sides also agreed to cooperate on case-by-case enforcement against such company name misuse.
- China agreed to eliminate the requirement to submit viable biotech seeds for testing, a policy change which reduces the possibility of illegal copying of patented agricultural materials.
- However, China currently has terminated most bilateral cooperation in IPR because of our decision to file a WTO case challenging China's inadequate IPR enforcement.

a. What is the status of these commitments—is China living up to them?

Answer
China has made progress on some of these commitments, but needs to make further efforts in others. Specifically:

- China has cracked down on computers sold without legitimate software. This has corresponded to a significant increase in the sales of legitimate software in China. End-user piracy remains a significant problem.
- Enforcement efforts at fairs and markets are inconsistent. As detailed in the 2007 and 2008 Special 301 Reports, some local authorities have conducted raids or established procedures to assist right holders file complaints against sellers of infringing merchandise. In some jurisdictions, landlords of commercial markets may be found liable for the infringing activity of their merchants if they aren't able to demonstrate the implementation of effective policies to prevent the sell of pirated and counterfeit goods. However, in many markets, infringing goods are still openly sold, and in other cases, sellers of infringing merchandise are moving their shops to locales with less enforcement.

- There has been no sign of a significant shift in emphasis toward criminal enforcement in most jurisdictions. Chinese authorities at the central, provincial and local levels should increase the number of criminal prosecutions and increase criminal penalties to provide an effective deterrent against further infringement.
- To date, China has not licensed any 3G wireless technology. However, Chinese operators have taken steps to procure equipment and services for the installation of a network that appears will be dedicated to support wireless communications based on the TD-SCDMA standard. China Mobile, the world's largest mobile operator, began rolling out a massive "test" TD-SCDMA network in nine coastal cities in late 2007. No other operator has been permitted to deploy alternative 3G technology, even on the kind of "test" basis authorized to China Mobile.
- China acceded to the WIPO Internet Treaties in June 2007. This combined with the adoption of the important Internet-related measure "Regulations on the Protection of Copyright Over Information Networks", which went into effect in July 2006, was an important step in the right direction. However, China could benefit from further clarification on various aspects of its implementation.
- The U.S. in monitoring the steps China is taking to implement the 2007 JCCT commitments to exchange information on customs seizures, strengthen enforcement against company name misuse, and eliminate the requirement for submitting viable biotech seeds for testing.

(6) How has USTR applied and enhanced Special 301 priority enforcement initiatives to identify and sanction countries that refuse to recognize US intellectual property rights?

Answer
In 2006, USTR began a new program called the Special 301 Initiative intended to make the Special 301 process even more effective. Under the Special 301 Initiative, USTR has focused attention on a select group of countries where there is a good possibility of progress through increased bilateral engagement. As a result, a number of trading partners have improved their legislation and enforcement. For example, this year Belize and Lithuania were removed from the Special 301 report following heightened engagement with the U.S. Government to address IPR concerns.

In addition, USTR has used sanctions as an effective tool in the past. For example, in 2001 USTR designated Ukraine as a Priority Foreign Country, revoked GSP benefits, and issued trade sanctions due to rampant optical disc piracy. After Ukraine made significant progress by passage of optical disc legislation and enforcement improvements, USTR lifted trade sanctions and restored GSP benefits in 2006, while moving Ukraine to the Priority Watch List. In the 2008 Special 301 Report, USTR moved Ukraine to the Watch List due to significant legislative improvements on IPR achieved during WTO accession negotiations, as well as progress on IPR enforcement, including the lack of evidence for two years of pirate optical disc manufacturing in Ukraine.

FREE TRADE AGREEMENTS

Question 12
In your testimony, you state that *"These agreements have been an enormous gain for American farmers, workers, entrepreneurs and consumers. U.S. exports to the 14 countries with which we have FTAs that have entered into force have grown over 40 percent faster than U.S. exports to the rest of the world."*

(1) What types of products and which sectors benefit the most from these agreements?

Answer
At Congress' direction, the United States International Trade Commission (USITC) has investigated and reported on the anticipated economic effects of each free trade agreement the United States has concluded over the past five years. Among other things, these reports describe in detail the potential impact of each agreement on U.S. exports in selected sectors (as well as on imports, production, and employment). These reports are compiled using widely accepted economic tools and draw from the USITC's substantial product expertise. They seek to assess the likely economic effects of each agreement in isolation from the many other factors that influence trade flows. As would be expected, the anticipated sectoral effects vary by FTA partner. The USITC reports, taken together, provide the best available estimation of how our FTAs can be expected to affect particular U.S. exports. The USITC's reports and abstracts are available at:

http://www.usitc.gov/ind_econ_ana/research_ana/pres_cong/332/index.htm

To supplement the USITC studies, we have prepared the attached tables listing the twenty sectors that have experienced the greatest export growth in trade with each of our 14 current FTA partners. The list is based on the sectors set out at the two-digit level in the U.S. Harmonized System of trade classification.

In addition to setting out export values, the tables show overall growth rates for each of the 20 sectors. In order to make the lists of high-growth sectors meaningful, we excluded sectors that experienced high percentage export growth but generated low export values. At the bottom of each table, we have compared aggregate export values and average growth rates for the 20 sectors with aggregate export values and average growth rates for all other sectors.

Note: All but two of the tables compare the dollar value of U.S. exports in the year before the relevant FTA entered into force to the value of U.S. exports in 2007. Because similar data is not available for exports to Israel and Canada, the tables for those countries compare U.S. exports in 1990 with those in 2007. (Our FTAs with those countries entered into force in 1985 and 1989, respectively).

In contrast to the USITC studies, which attempt to isolate the effects of FTAs on trade flows, the attached tables report actual, recorded trade flows. Changes in actual trade flows reflect the impact not just of our FTAs but of other factors as well, such as changes in economic growth rates. What the trade flow data tell us, however, is that in the aggregate U.S. exports have grown substantially – 40 % – faster to our FTA partners than to the rest of the world. That helps confirm our view that our FTAs have a strong positive effect on our exports.

(2) With respect to the Colombia Free Trade Agreement, what is the benefit to Colombia to enter into this agreement, if it already enjoys duty free status on most of what it exports to the U.S.?

Answer
Colombia stands to benefit in multiple ways from the Agreement. First, the trade preferences that the United States has extended to Colombian products are only temporary and subject to renewal. Permanent duty free access to the U.S. market will benefit Colombia exporters and encourage investment in Colombia. Second, the Agreement will provide new access to the U.S. market for products that are not currently duty free. In addition, the agreement's requirements for transparency and due process will increase confidence in Colombia as a place to invest.

(3) What sectors and products are likely to be exported to Colombia?

Answer
The list of U.S. products that stand to benefit from the Agreement is long. For instance, no U.S. agricultural exports currently enjoy duty-free access into Colombia and many face very high duties, such as 80 percent tariffs for U.S. prime and choice beef and rice. Under the Colombia FTA, all of Colombia's tariffs on agricultural products go to zero. On more than half of U.S. agricultural exports, Colombian tariffs would be eliminated immediately on entry into force of the Agreement. Among the U.S. products that would enjoy duty-free entry right away are wheat, soybeans and soybean meal, prime and choice beef, whey, cotton, all fruits, most vegetables, almonds, pistachios, and walnuts, wine, and many processed food products. The Agreement also would provide new duty-free access through tariff-rate quotas (TRQs) on products including corn, rice, animal feeds, chicken leg quarters, and dairy.

In addition, under the Agreement, Colombia would immediately eliminate its price bands on trade with the United States. These apply to more than 150 agricultural products, provide for tariffs that vary with world commodity prices, and allow Colombia to raise its duties to its WTO bound rates. Variable tariffs also make doing business in Colombia difficult, given the lack of transparency on the cost of entering this market. In addition, Colombia will eliminate its domestic purchase requirements. These have impeded entry of key U.S. farm exports such as corn and rice. Colombia also has eliminated non-science-based restrictions on imports of U.S. beef and beef products for human consumption by re-opening its market to such products, consistent with international standards.

As to other sectors, over 80 percent of U.S. exports of consumer and industrial products to Colombia will be duty-free immediately upon entry into force of the Agreement, with remaining tariffs phased out over ten years. Within each of the following key industrial sectors, most products will gain immediate duty free access to the Colombian market: agriculture and construction equipment, aircraft and parts, fertilizers and agro-chemicals, information technology equipment, and medical and scientific equipment.

(4) What environmental and labor principles have been incorporated into the agreement?

Answer
The labor and environmental provisions reflect the outcome of the Bipartisan Trade Deal announced by House Speaker Pelosi, Ways and Means Chairman Rangel, and the Administration on May 10, 2007. As a result, the Colombia agreement--like those with Peru, Panama and Korea--represents a new approach in our FTAs, going well beyond any previous agreements. In particular, the provisions include new obligations to implement certain multilateral environmental agreements, such as the Convention on Trade in Endangered Species of Wild Flora and Fauna (CITES), an obligation to adopt and maintain in law and in practice the internationally-recognized core labor principles as stated in the ILO Declaration on Fundamental Principles and Rights at Work, and stronger obligations to not derogate from labor or environmental laws to attract trade or investment. Additionally these labor and environmental provisions are subject to the same dispute settlement procedures and remedies as those that apply to commercial disputes.

Question 13
In your testimony before the Senate Finance Committee on March 6, you say that "the levels of violence have been reduced substantially…with kidnappings down more than 80 percent since 2002." The homicide rate has also dropped by 40 percent.

(1) What was the number of kidnappings in 2002?

Answer
There were 2,882 kidnappings in Colombia in 2002.

(2) What was the number of murders in 2002

Answer
There were 28,837 homicides in Colombia in 2002.

Question 14
In your testimony, you give credit for the decrease in crime to efforts launched before the FTA negotiations began, but that Colombians believe this FTA will lead to greater economic growth—and presumably, a further decrease in crime. What assurances will the American public have that free trade law will be honored in Colombia?

Answer
The agreements contain dispute settlement provisions that can be used if a party believes the other party is failing to fulfill an obligation of the agreement. If we were unable to resolve such an issue with Colombia through consultations, we would have recourse to a dispute settlement panel. If Colombia were to fail to implement an adverse panel ruling or to offer adequate compensation, the United States could suspend some of the benefits of the agreement.

2009 INITIATIVES

Question 15
According to the USTR's justification, the President has committed to establishing a Middle East Free Trade Area by 2013. As part of that effort, USTR will conduct bilateral trade negotiations with several Middle Eastern countries in fiscal year 2009.

(1) Which Middle Eastern countries are involved?

Answer
Presently, the United States is actively discussing trade issues with a number of Middle Eastern countries, having in mind throughout these discussions the President's goal of establishing the MEFTA by 2013.

The United States holds annual or biannual consultations under the Joint Committees established under our free trade agreements with Israel, Jordan, Morocco, and Bahrain – and will also hold such meetings with Oman once the FTA with that country enters into force. We use the Joint Committee meetings to discuss the operation of the FTAs, as well as platforms for launching further negotiations on specific topics. For example, the October 2007 United States- Israel FTA Joint Committee kicked off the latest round of bilateral negotiations for new market access commitments in the agriculture sector.

The United States has also concluded Trade and Investment Framework Agreements (TIFAs) with a number of non-FTA partner countries in the region (Egypt, Saudi Arabia, UAE, Qatar, Kuwait, Tunisia, Lebanon, Yemen, Algeria, and Iraq) and uses annual or biannual TIFA meetings to discuss current issues and launch negotiations on specific trade and investment issues as warranted. For example, the United States is intensifying our work with several TIFA partners on improving protection of intellectual property rights.

The United States is also considering whether to begin Bilateral Investment Treaty discussions with some governments in the region, including Egypt, Saudi Arabia, Kuwait and Qatar.

(2) Have trade negotiations already begun?

Answer
As noted above, the United States and Israel have already launched a new round of negotiations on agriculture under our bilateral FTA.

(3) Will this initiative be affected by fiscal limitations?

Answer
Budget constraints could limit the extent to which USTR personnel are able to travel to the Middle East and North Africa to pursue discussions and negotiations under the MEFTA. We can use Video Teleconferencing (VTC) to some extent to offset travel fund constraints, but many

partners in the region either lack adequate VTC infrastructure or insist on face to face discussions and negotiations.

Question 16
Recently, USTR completed a Memorandum of Understanding (MOU) with China on combating illegal logging and associated trade. Please describe the MOU's provisions generally.

Answer
The United States concluded negotiations with China on the MOU at SED III in December 2007 and was signed in early May 2008. The MOU establishes a U.S.-China bilateral forum through which the two parties will explore initiatives and opportunities to address illegal logging, taking into account the global role our two countries play as major importers and exporters of forest products. The bilateral forum is likely to meet for the first time on the margins of SED IV in June. In particular, the MOU directs the parties to work cooperatively to combat illegal logging and associated trade and to promote trade in legal timber and products from such timber. The initial focus is likely to be on establishing new mechanisms for sharing trade, customs and law enforcement information related to timber that originates in third countries, such as Indonesia. Additionally, the parties will use the bilateral forum to initiate public-private partnerships to combat illegal logging in third countries.

STEEL, LABOR, AND ENVIRONMENTAL PROGRESS

Question 17
In the steel sector, USTR worked with the Organization for Economic Cooperation and Development (OECD) Steel Committee, the North American Steel Trade Committee (NASTC), in WTO accession negotiations, and with countries bilaterally to focus on steel capacity worldwide and subsidy and other marketing distortions. The JCCT Steel Dialogue was launched on March 24, 2005; a follow-on meeting was scheduled for late 2006 with industry participants. Please describe the ongoing work affecting the steel sector. What accomplishments, if any, have been achieved?

Answer
China
We are monitoring developments, including imports into the United States and Chinese government policies, very closely. In the past two years, China's steel production exceeded that of the European Union, Japan, and the United States combined. China has quickly grown from a large net importer in 2004 to the world's largest exporter 2007. While market conditions for U.S. steelmakers remain generally favorable, we are concerned about the potential imbalances that the tremendous growth in Chinese steel production may have on global markets, including the United States.

USTR began stepping up its engagement with China on steel issues in December 2005 when we initiated the U.S.-China Steel Dialogue as part of the Joint Commission on Commerce and Trade (JCCT). We have held three steel dialogue meetings, two in Beijing (March 2006 and October 2006), and the last one in Washington, D.C. (August 2007). With our Commerce Department colleagues, we have regularly raised concerns about China's industrial policies and government intervention in the steel sector. U.S. steel producers have participated actively in the last two dialogue meetings. In December 2007, Chinese government officials agreed to continue our discussions in a fourth steel dialogue meeting which we hope to schedule in June 2008.

I personally raised strong concerns about government-supported growth in China's steel sector during the first Strategic Economic Dialogue (SED) meeting held in Beijing in December 2006, and at the May and December 2007 SED meetings. We have stressed that China needs to move towards market mechanisms in the steel sector and to reduce excess steelmaking capacity.

In 2007, Chinese officials took action to slow the export of steel products by reducing rebates of value-added taxes on exported products and by imposing export duties on many steel products. While these steps have slowed some of China's steel exports, they also raise concerns. For example, China has applied these measures selectively, which results in the export of some products being discouraged and others encouraged. We raised these and other concerns during the U.S.-China Steel Dialogue meetings in August 2007. In March 2008, during my meetings with China's new leadership, I again pointed out that there are still significant disparities in how Chinese exports are taxed at the border, leading to distortions in trade for many products, including steel products.

We have also continued to raise strong concerns about China's use of export quotas on a number of steelmaking raw materials, both during the steel dialogue and in meetings with China's leaders. These export quotas and related policies give enormous cost advantages to China's downstream producers in the steel industry and a wide range of other industries whenever the export restraints allow Chinese producers to obtain their raw material inputs at prices that are well below world prices.

The Administration remains committed to enforcement of U.S. trade remedy laws, and the Commerce Department is currently conducting antidumping and countervailing duty investigations on four tubular steel products from China. In addition, while dialogue remains our preferred way of addressing trade problems, we will not hesitate to bring enforcement cases at the WTO when appropriate, as demonstrated by the five proceedings that we have initiated against China in the last two years. One of those disputes involved prohibited subsidies, which were benefiting a wide range of industries in China, including the steel industry. We successfully settled that dispute in November 2007, based on China's commitment to eliminate all the prohibited subsidies we had challenged effective January 1, 2008.

While we have continuing concerns that Chinese steel growth is not always driven by market considerations, there have been some positive developments in the Chinese steel sector since the steel dialogue began. U.S steel imports from China declined significantly overall from 2006 to 2007, although there continue to be increases in imports of some products, such as oil country tubular goods. Market analysts agree that credit available to the Chinese steel sector has tightened in the past two years. The differentials between Chinese steel and U.S. steel prices also have decreased. The rate of growth in Chinese steel production is slowing, and the Chinese government has taken the following measures:

- ✓ China concluded agreements with provincial governments and producers to close small, inefficient steel mills, and more than 22 million tons of capacity was eliminated in 2007. While this tonnage is small compared to overall Chinese production, it represents progress in reducing overcapacity in China. Much more progress in market-driven consolidation and rationalization is necessary.
- ✓ While there are still substantial restrictions on foreign investment in the Chinese steel sector, we are stepping up our discussions in the JCCT and SED to press China to improve its opaque investment reviews and eliminate its investment restrictions.

OECD Steel Committee and North American Steel Trade Committee

USTR's bilateral and multilateral efforts to address trade distorting practices continue through the Organization for Economic Cooperation and Development (OECD) Steel Committee, the North American Steel Trade Committee (NASTC), through WTO negotiations, and bilateral contacts with steel-producing countries, including the European Union, Brazil and Japan.
The United States supported efforts by the OECD Steel Committee secretariat to include China, India, Russia, Brazil and other non-OECD steelmaking countries in committee discussions on key issues such as the ongoing consolidation in the global industry and its impact on workers, production, trade, and competition. In addition to continuing work on subsidies and capacity, the Administration began working with OECD Steel Committee participants, and North American governments and steel industry representatives in the NASTC, to examine issues related to global climate change regulation and the potential impact on trade and competitiveness in the steel sector. In the NASTC, we have conducted joint activities to monitor external trade developments, and we have used the forum to coordinate joint policy responses, including positions in the WTO, where appropriate.

Rising raw material prices have increased pressure on governments to restrain their exports of key raw materials, contributing to cost increases both for U.S. steelmakers and for downstream manufacturers that purchase steel. USTR worked both bilaterally and through recent WTO accession negotiations to obtain reductions or eliminations in export duties on certain steelmaking raw materials (ferrous and non-ferrous scrap) from Russia, Ukraine, and Vietnam. In addition, the United States recently cosponsored a Japanese proposal in the WTO Non-Agricultural Market Access Non-Tariff Barrier negotiations to increase transparency in export licensing measures. Governments frequently use these measures to restrict exports of raw materials consumed in steel production and other sectors.

Question 18

In the DOHA round, USTR has put forward a proposal to eliminate or cut back dramatically on subsidies that result in over-fishing. Please describe the proposal generally. What reception has the proposal received? Does it have a chance at inclusion?

Answer

The U.S. proposal, tabled in the spring of 2007, is a comprehensive vision of a new WTO agreement to prohibit harmful fisheries subsidies. It presents a "top-down" approach that would impose an across-the-board prohibition with carefully circumscribed exceptions for programs that do not promote overcapacity, such as vessel buy-back programs. It also includes ideas for increasing transparency associated with practices in WTO Members to provide assistance in the sector and ensuring appropriate fisheries expertise in dispute settlement proceedings.

The current Chairman's negotiating text, while adopting a "bottom-up" approach (a specific list of prohibited subsidies), goes a long way to reflect the level of ambition in the U.S. proposal. A number of challenges remain and there are important delegations, such as the EU, Japan and Korea, which have yet to signal a commitment to a meaningful result. We are confident, however, that these negotiations will be successful, and we are particularly encouraged by the high level of interest and support from interested environmental NGOs.

Question 19
There are also attempts to include environmental restrictions on trade. However, in your statement before the Senate on March 6, 2008, you said that the two dozen or so trade ministers that met in Bali to discuss the nexus between trade and the environment "largely agreed that nations should avoid using the environment and climate change as an excuse to impose trade restrictions." I take issue with the word "excuse." Can you please explain, in more detail, what that statement means?

Answer
This statement reflects our grave concern that there may be a rush to include provisions to unduly restrict imports as part of a larger national climate change mitigation strategy. In addition to questions regarding WTO obligations, we believe there are other immediate and significant risks that also need to be weighed. First, action that is specifically focused on addressing "competitiveness" concerns can easily open the door to demands that go well beyond the perceived economic consequences of implementing a U.S. climate change strategy. Second, we are concerned that likely target countries – large developing countries – could either use the threat of trade sanctions as an excuse not to engage in serious climate change commitments and/or respond in kind to restrict their imports of U.S. products. We can expect that their unilateral definition of sufficient action on climate change would focus on per capita or historical emissions of greenhouse gases. And already some in the European Union have suggested that imports from the United States should be restricted because the United States is not a party to the Kyoto Protocol. It is not difficult to imagine that the consequences of competing national actions to restrict imports could have considerable negative implications, leading to serious trade disputes, greater uncertainty in global markets, and even serious risks to the spirit of global responsibility that is essential to concluding a new United Nations agreement for the post-2012 period.

On a positive note, we have been exploring some very concrete positive connections between trade and climate change. In fact, late last year, just prior to the Bali trade ministerial meeting on the margins of the UN climate meetings, we joined the European Union in submitting a new proposal on eliminating tariffs on climate-friendly technologies as part of the WTO Doha negotiations. The World Bank has estimated that removal of trade barriers to these technologies, which are critical to efforts to promote transfer of clean technologies to developing countries, could significantly increase international trade in – and use of -- such products.

Question 20
I note that there are some multilateral environmental agreements and internationally-recognized labor principles incorporated into trade agreements. Has any enforcement been required or considered to date? These agreements do not go far enough. Is USTR continually working on improving the environmental and labor restrictions with respect to trade?

Answer
The reference to multilateral environmental agreements and internationally-recognized labor principles appears to be focused on those agreements that were completed after announcement of the Bipartisan Trade Deal on May 10, 2007. We disagree with the characterization that these "agreements do not go far enough" given that all four were completed after the announcement of the Bipartisan Trade Deal on May 10, 2007, and reflect the specific elements on environment and labor put forth by the Congress. Moreover, Congress has only passed legislation associated with the Peru agreement and that agreement has not yet entered into force.

We see opportunities associated with trade agreements to achieve significant accomplishments on environment and labor including enforceable obligations to ensure labor rights and environmental protection and support other countries in pursuing improvements in their environmental and labor protections. We are committed to ensuring full implementation of environmental and labor obligations in our free trade agreements and to pursuing options when necessary to address any shortcomings.

We continually raise labor- and environment-related concerns with our trading partners as they arise. For example, we have seen significant improvement in Jordan with respect to labor rights because the FTA has provided both a forum to raise labor concerns with the Government of Jordan and leverage to help ensure adequate actions are taken to improve the conditions of workers in Jordan. The Administration also supports funding in many countries, from Central America to the Middle East, to provide longer-term support to assist countries in meeting their labor and environment obligations. We believe in cooperatively working with our trading partners to improve adherence to labor rights and laws protecting the environment knowing we can invoke dispute settlement procedures if other means fail. We have been successful in getting partners to address labor and environment concerns in their countries and will continue to work to do so.

WTO DECISION ON AUTO PARTS

Question 21
The WTO issued its first official condemnation of Chinese commercial practices, siding with the United States, European Union and Canada in a dispute over car parts, the *Associated Press* reported. What effect will this decision have on American manufacturers?

Background
According to a copy of the confidential ruling's conclusions obtained by the AP, the WTO found that China was breaking trade rules by taxing imports of auto parts at the same rate as foreign-made finished cars. In the sweeping decision, the WTO panel found against China on nearly

every point of contention with the United States, European Union and Canada. The three trade powers argued that the tariff was discouraging automakers from using imported car parts for the vehicles they assemble in China. As a result, car part companies had an incentive to shift production to China, costing Americans, Canadians and Europeans their jobs, they said.

Answer
Although the WTO panel's report is final, it has only been provided to the parties to the auto parts dispute. Under WTO rules, it remains confidential until it has been translated into official WTO languages and circulated to all WTO Members. We expect the report to be circulated sometime this summer.

The Chinese measures that we have challenged encourage auto manufacturers in China to use parts made within China instead of parts imported from the United States or elsewhere. China's removal of these measures would create a level playing field for U.S. manufacturers of auto parts.

The dispute also addresses broad systemic concerns, extending beyond the auto parts sector. In particular, the case is important in emphasizing that the United States cannot accept industrial policies that unfairly force manufacturers either to purchase local inputs or to relocate manufacturing operations to China.

ADDITIONAL QUESTIONS

Question 22
Ambassador Schwab, the Committee has learned that a meeting of world trade ministers to discuss the Doha trade round might be scheduled soon. Can you provide us with any insight into when and what the discussions will cover?

Answer
We have been working hard in Geneva to narrow outstanding issues in the Doha Development Agenda negotiations. New texts in the agriculture and non-agricultural market access (NAMA) negotiations have just been issued and are being analyzed. They are supposed to set the stage for a meeting of senior officials and then ministers when there is some prospect of a constructive meeting. Such a meeting would aim to finalize formulas and frameworks for final stage negotiations. A "signaling conference" on services market access is to take place at the same time as the Ministerial meeting. Negotiators are working with a sense of urgency, but substance must drive the negotiations and the timing of when Ministers will meet. The date of the Ministerial level meeting could change if too many outstanding issues remain in the forthcoming texts.

Question 23
The Committee also notes that the Administration formally transmitted the Colombia Free Trade Agreement to Congress yesterday. What are the Administration's views on the Trade Adjustment Assistance bill that Secretary Chao outlined at yesterday's export council meeting?

Answer
The President has expressed his support for TAA reauthorization and reform. Although trade overall benefits America and American workers, we recognize that certain workers are adversely impacted by trade and we should assist those workers. The administrative reforms Secretary Chao outlined are important for providing workers with assistance to improve their opportunities to return to work as quickly as possible in high skill jobs that pay good wages. We view this as the beginning of a discussion with Congress as to how best to reauthorize and improve the TAA program.

Representative Frelinghuysen

Question 1
Funding for Built-in Costs of Pay Increases:
Your budget document not only does not request any additional funding for a mandatory pay increase in January 2009, but it also does not display the amount you would have to absorb as a result. Can you provide for the record, your FY09 built-in costs associated with a 2.9% pay raise in January 2009, and the costs of annualizing the 3.5% pay raise in 2008?

Answer
With an assumed 2.9% increase in FY 2009, this would increase our payroll costs by $0.7 million. This assumption does not include a locality pay increase component which was 1% for Washington based employees in FY 2008. Salary and benefits for USTR staff in Geneva is managed under State Department policy. Geneva based USTR employees receive Post Allowance and Living Quarters allowances in addition to the salaries. These costs provide housing and food subsidies based on the cost of living in that location relative to the U.S. Our arrangement with State has permitted USTR to have one person who becomes a non-reimbursable State Department employee. If we use the same assumption, the nine (9) month COLA payroll costs for 229 FTE would be $1 million.

The cost of annualizing the 3.5% FY 2008 pay raise is $1.2 million. We think it is appropriate to include the locality component as well. In effect, Washington based employees received a 4.49% pay raise. When included, the cost of the pay raise to USTR is $1.5 million on an annualized basis in FY 2008.

Taken together, this would be a cumulative cost of approximately $2.5M in FY 2009.

Question 2
Costs of Increasing Staffing Levels:
In last year's House bill, we provided funding above the request to support a modest increase to 235 FTE with the increased staffing to be devoted to intellectual property protection, China and filling attorney vacancies. Your request for FY09 will support even less than the current level. What appropriation amount would be necessary to again support a modest increase to 235 FTE?

Answer
Our FY 2009 budget takes into account the turnover that occurs during the transition period between administrations.

The individuals filling any extra positions would likely be at a median level of GS-15 Step 1. The projected personnel costs in FY 2009 for this level with salary and benefits would be approximately $150 thousand annually per FTE. Six FTE would be $0.9 million. In addition, there would be incremental costs for travel, communications, supplies, office furniture, subscriptions, etc. which we estimate at about $30K per person. This would bring our total additional costs to about $1.1 million, and are only speaking of DC based personnel.

Question 3
One of your staffing priorities identified last year was filling vacant attorney positions working on intellectual property enforcement. How many FTE are associated with this activity and how many enforcement attorney vacancies do you have currently?

Answer
Our Office of the General Counsel has three staff attorneys assigned to cover Intellectual Property Rights (IPR) matters. We have also assigned other attorneys as needed to pursue specific IPR enforcement actions in the World Trade Organization (WTO), including at this time two additional attorneys assigned to pursue the case we have brought in the WTO against China's IPR measures. This is in addition to attorneys and non-attorney experts who staff our IPR office, such as the current Assistant USTR for Intellectual Property & Innovation, and who play a key role in monitoring IPR compliance. USTR has a total of thirty six (36) attorney/legal specialist positions in Washington and Geneva, of which 31 are in the Office of the General Counsel and five in Geneva, and all but one work on monitoring and enforcement issues to some degree. All but two are filled and the two vacancies are in active recruitment. The IPR Office has a current authorized staffing of six policy analysts and one attorney (Chief IP Negotiator for IP Enforcement) with one vacancy (excluding the administrative position).

Question 4
How has the enforcement staffing level grown compared with the increase in the number of free trade agreements in force? Do you use a formula to determine the required staffing associated with enforcement of each existing free trade agreement?

Answer
USTR devotes substantial human resources to monitoring and ensuring compliance by our free trade agreement partners with their FTA commitments. The great majority of our staff attorneys in Washington and Geneva, under the direction of our Assistant USTR for Monitoring and Enforcement, spend all or a substantial portion of their time prosecuting or defending litigation matters arising out of our trade agreements.

In addition, most other trade policy analysts at USTR participate in compliance matters as the need arises. They include USTR policy and legal experts on issues such as intellectual property rights, services, investment, technical barriers to trade, customs administration, import licensing, rules of origin, information technology, tariffs, subsidies, agriculture, and sanitary and phytosanitary barriers. Several other Washington agencies also devote substantial resources to day-to-day trade agreement compliance and enforcement activities. They include the Departments of Commerce, State, Agriculture and Treasury.

A critical contribution to ensuring that our trading partners comply with their FTA obligations is to make sure that they have taken the steps necessary to carry out the agreement before it enters into force. Accordingly, our attorneys and other professional staff work closely with our FTA partners to ensure that they have adopted the laws, regulations, and other measures we believe are necessary to ensure they will fully meet their obligations under the agreement beginning on Day One. Once an agreement is in force, the Office of the General Counsel works closely with USTR's subject matter and geographic offices, as well as other government agencies and domestic stakeholders to monitor FTA compliance.

To meet the challenges of ensuring our trading partners live up to their trade agreement commitments, USTR has increased FTE levels from 173 in 2001, when we had FTAs in place with three countries, to an anticipated 229 in 2008 with FTAs currently in place with 14 fourteen countries. Over the last few years we have added positions in the Office of China Affairs (Beijing three positions), Office of Intellectual Property and Innovation (two), Office of Services and Investment (one), Office of Agricultural Affairs (two), Office of Japan, Korea and APEC Affairs (one), Office of Labor Affairs (one), Office of the WTO and Multilateral Affairs (two), and the Office of the General Counsel (four). Since 2001, we have grown from 24 attorney/legal specialist positions to 36 today, a 50% increase.

We do not have an FTA-driven formula to determine enforcement staffing. We have regional staff responsible for each of the FTA's, and more general attorney/enforcement staff that can focus on problem areas across the board as they are identified. As FTA negotiations conclude with a given country, the regional staff that helped negotiate the agreement are often in the best position to ensure its full implementation.

Representative Culberson

Question 1
Ambassador Schwab, a company in my district that makes powered industrial trucks – more commonly called forklift trucks – recently brought to my attention the tariffs that are imposed on powered industrial trucks and components manufactured here in the United States and then exported to the European Union, China, Korea, and Taiwan. As you may know, when powered industrial trucks are manufactured in foreign countries and imported to the United States, these products come in duty free, as the U.S. eliminated these import duties in the 1980s. But U.S. manufacturers are paying a heavy import duty when sending their products abroad – for instance, the European Union charges 4.5%; Korea is 8.0%; China is 9.0% (on internal combustion trucks only); and Taiwan ranges from 5-10%. My question for you: what is USTR doing to negotiate an elimination of these tariffs for powered industrial trucks that are being shipped abroad and how soon can we expect for them to be eliminated? In the ever increasing global market, it is vitally important for our U.S. manufacturers to be able to compete in a competitive level.

Answer
USTR has been working closely with industry to secure the reduction or elimination of duties on manufactured goods as part of the World Trade Organization (WTO) Doha Round negotiations on Non-Agricultural Market Access (NAMA). In the NAMA negotiations, Members have agreed to use a "Swiss" formula, which cuts high tariffs more deeply than low tariffs, with the effect of harmonizing tariffs across each WTO Member's tariff schedule. While the specific tariff cut formula is still under negotiation, we are committed to achieving an ambitious agreement that will lower tariffs and provide additional export opportunities for U.S. companies, including industrial truck producers.

Of specific interest to this industry is our proposal within the NAMA negotiations for a "sectoral" agreement on industrial machinery. This agreement would eliminate duties on a specific range of industrial machinery, including powered industrial trucks. The United States, along with Canada, Japan, Norway, Singapore, and Chinese Taipei, are currently supporting such a proposal, and we are working to gain the support of other key exporters and importers, including the European Union, China, and Korea, so that most of the world's trade in powered industrial trucks would be duty free.

Additionally, we have been working to address high tariffs as part of our Free Trade Agreement (FTA) negotiations with other countries, including Korea. For example, under the Korea-U.S. (KORUS) FTA, Korean tariffs on U.S. powered industrial trucks will be eliminated within 10 years of entry into force of the FTA. We hope to see Congress take up this important piece of legislation in 2008.

Representative Harold Rogers

Question 1
President Bush recently transmitted the Colombia Free Trade Agreement to Congress for approval. How will the Colombia Free Trade Agreement strengthen our fight against illicit drug trafficking?

Answer
The Colombian people have made significant, measurable progress over the last several years in their efforts to wrest control of their country from violent terrorist groups and ruthless narcotics trafficking cartels. However, much remains to be done. Colombia needs the continued support of the United States to address ongoing challenges of violence, displacement and economic hardship, which are inextricably interwoven with the drug trade. The United States-Colombia Trade Promotion Agreement is a crucial tool to provide licit jobs and economic alternatives to violence and drug production. The Agreement will help Colombia attract investment, create jobs, grow its economy and reduce poverty. All of these elements will diminish incentives associated with narcotics trafficking and empower Colombia to become a self-sustaining partner in the fight against the illegal drug trade.

Question 2
In negotiating trade agreements with foreign governments, does USTR have any formal policies regarding the safety of foreign trade unionists? What mechanisms, if any, does USTR have in place to measure whether the government of Colombia or other countries is meeting certain quality or safety standards or benchmarks?

Answer
Both before and during each FTA negotiation, USTR – in coordination with the Departments of State and Labor – consults extensively with the prospective FTA partner, labor unions, business groups, and non-governmental organizations in order to assess the labor rights situation in the country or countries involved. In the case of Colombia, our consultations focused particularly on issues of violence against trade union members and impunity. In conjunction with other U.S. Government agencies, USTR is continuing to work with the Colombian government and other entities to assess progress on these issues, including Colombia's efforts to increase the resources it has devoted to investigating and prosecuting violence against labor leaders, to make its enforcement efforts more effective, and to provide protection to trade unionists who are under threat.

Our agreement with Colombia includes provisions designed to ensure that labor rights are protected, including freedom of association and the right to organize and bargain collectively. The Colombia Trade Promotion Agreement also includes a set of strengthened labor provisions (as compared to previous FTAs), reflecting the results of the bipartisan May 10, 2007 agreement between the Administration and the Congressional leadership. Among other things, the Agreement obligates Colombia to maintain the fundamental labor rights enumerated in the International Labor Organization's *Declaration on Fundamental Principles and Rights at Work.* The FTA also requires Colombia to effectively enforce its labor laws, including those designed to protect trade union activity. Moreover, these obligations are enforceable under the Agreement's dispute settlement provisions through the same procedures and remedies that apply to commercial disputes. USTR will work to ensure that Colombia meets its all of its obligations under the Agreement, including its commitments with respect to labor rights.

Question 3
What actions has USTR taken to implement measures that will gradually reduce this trade deficit, particularly with China?

Answer
USTR's mission is to open markets to U.S. exports and to attack trade barriers around the world. USTR is fully engaged in these efforts across the globe, with China as a key focus. China clearly benefits from its access to global markets, including the United States. But, China must also contribute as a responsible stakeholder in the multilateral trading system. Specifically, we need to see continued significant progress by China in opening its markets to U.S. exporters and in adhering to international trade rules. USTR has used bilateral engagement to achieve such objectives, including the intensive, high-level work that takes place in the U.S.-China Joint Commission on Commerce and Trade and the U.S.-China Strategic Economic Dialogue. USTR also is fully engaged in pursuing these objectives in multilateral fora, including the WTO. In particular, we need to see China's full adherence to its WTO commitments. Where China has not been willing to provide the agreed access to its markets or has otherwise not played by the rules, and dialogue has failed to secure a resolution, we have not hesitated to bring WTO dispute settlement cases against China. Over the last two years, we have brought five WTO cases, each involving substantial U.S. interests. The Commerce Department, which is responsible for administering our trade remedy laws, has also been active in combating unfair trade practices on the import side of the ledger. It has conducted numerous antidumping investigations involving Chinese products, and, since November 2006, has been conducting countervailing duty investigations of imports from China.

Question 4
Since 1994, the Chinese government has consistently sought to undervalue its currency vis-à-vis the dollar, with estimates ranging from 15% to 40%. The artificially low value of the yuan has forced other East Asian economies to keep the value of their currencies low to compete with Chinese products. Although the Chinese government announced in 2005 that the yuan's exchange rate would become "adjustable, based on market supply and demand," China's Central Bank insists that reforms be done in a "gradual" way. From 2005 to 2008, the dollar-yuan exchange rate appreciated by 13.9%, but many contend these reforms have not moved fast enough.

In addition to currency manipulation, the Chinese government provides significant subsidies to many domestic industries, which are harmful to U.S. producers competing with Chinese products globally. In March 2007, the U.S. Department of Commerce reversed a 23-year policy preventing U.S. producers injured by subsidized imports from seeking countervailing duties (CVD) against Chinese products and issued a preliminary ruling to impose CVDs ranging from 11% to 20% against certain Chinese products.

> (1) What recent actions has USTR taken with regard to Chinese currency manipulation and industry subsidization? Have these actions been sufficient to level the playing field between U.S. and Chinese producers on the international market?

Answer
The Treasury Department has been leading the Administration's extensive efforts in addressing China's exchange rate policies, including ongoing intensive engagement with China's leadership as well as efforts in multilateral settings.

With regard to subsidization of China's industries, USTR initiated a WTO dispute against China in February 2007 on a dozen export subsidies and import substitution eliminate upon accession. These subsidies were maintained contrary to an explicit WTO prohibition. Mexico subsequently filed a similar case, and at our request the WTO established a dispute settlement panel in August 2007 after our joint consultations failed to resolve the dispute.

In late 2007, in a major victory for the United States and Mexico, China agreed to settle the case by eliminating all the prohibited subsidies no later than January 1, 2008. And by January 2009, China will also make the necessary technical changes to permanently remove a related legal measure. We have been carefully monitoring China's implementation of these commitments and have detected no problems to date.

The subsidies we challenged were substantial and benefited a wide range of Chinese manufactured goods and multinational enterprises. At the same time, import substitution and export-contingent subsidies fall within the so-called "prohibited" category under WTO rules. A WTO case against subsidies that do not fall in this "prohibited" category is significantly more complex. U.S. industries affected by these kinds of subsidies have normally preferred using our domestic trade law remedies to get relief. Last year, the Commerce Department determined that our countervailing duty law can apply to imports from China, and it is currently conducting several countervailing duty investigations of imports from China.

> (2) How would the USTR assess China's efforts to move to a floating currency?

Answer
The Treasury Department is the agency within the U.S. Government responsible for evaluating other countries' exchange rate policies. Treasury leads the Administration's extensive efforts on this issue vis-à-vis China, including ongoing intensive engagement with the Chinese leadership as well as in multilateral settings.

> (3) Does USTR anticipate issuing additional CVDs against other Chinese products within the next six months? If so, what are they?

Answer
The Commerce Department is the agency charged with the responsibility for administering U.S. CVD law. It is currently conducting several CVD investigations involving imports from China. All of these pending CVD cases were filed by interested U.S. industries.

Representative Latham

Question 1
Obviously, the Colombia Free Trade Agreement is caught up in politics. Can you give me your thoughts on the impacts on US agriculture if Congress does not pass the Colombia FTA in a timely fashion?

Answer

The U.S.-Colombia Trade Promotion Agreement (CTPA) would change trade between the United States and Colombia from a "one-way street" to a "two-way street." Last year, Congress voted overwhelmingly to continue allowing duty-free access for nearly all Colombian goods entering the United States. However, no U.S. agricultural exports currently enjoy duty-free access into Colombia. In fact, U.S. exports to Colombia face duties as high as 35% in the case of industrial and consumer goods, and much higher for many agricultural products. For example, U.S. prime and choice beef and rice face 80% tariffs in Colombia.

Under the CTPA, Colombia will eliminate its tariffs on all U.S. agricultural (and other) products. Colombia will remove its duties on more than half of U.S. agricultural exports on the day the Agreement enters into force. Among the U.S. products that will enjoy duty-free entry right away are wheat, soybeans and soybean meal, prime and choice beef, whey, cotton, all fruits, most vegetables, almonds, pistachios, and walnuts, wine, and many processed food products. The CTPA will also provide new duty-free access to Colombia's market through "tariff-rate quotas" (TRQs) on certain products including corn, rice, animal feeds, chicken leg quarters, and dairy products. The "in-quota" quantities of these TRQs will expand over time as over-quota tariffs are phased out.

In addition, the Agreement will require Colombia to eliminate immediately on trade with the United States the "price band" duty system it applies to more than 150 agricultural products. Under its price band mechanism, Colombia adjusts its tariffs based on world commodity prices, which means that Colombia can raise its duties to prohibitive levels when commodity prices are low. Variable tariffs also discourage exports to Colombia by creating uncertainty about the cost of selling into its market. In addition, Colombia will eliminate its domestic purchase requirements. These have impeded entry of key U.S. farm exports, such as corn and rice. In parallel with our FTA negotiations, Colombia has also eliminated non-science-based restrictions on imports of U.S. beef and beef products for human consumption by re-opening its market to such products, consistent with international standards.

In sum, with each day that passes without a vote on the CTPA, opportunity passes U.S. farmers and ranchers by, that is, opportunity for free access to the Colombian market and for a significant advantage vis-à-vis third country competitors there. American agriculture also suffers when the ability of the United States to participate in future multilateral and bilateral trade agreements is undermined, as it has been with House inaction on the CTPA. One in three U.S. farm acres is planted for export, and as the U.S. market matures, access to the other 95% of the world's potential customers is critical to expanding sales and income for U.S. agricultural producers.

Question 2
Can you give me your dollar estimates on the benefits to US agriculture that will result from passage of the Colombia FTA?

Answer
Colombia is the largest market for U.S. agricultural exports in Central and South America and the Caribbean, with 44 million potential customers for U.S. products. In 2007, total U.S. agricultural goods exports to Colombia reached a record $1.2 billion. The Agreement eliminates all Colombia's agricultural tariffs, and for more than half of U.S. farm exports, duty-free entry will start immediately upon entry into force of the Agreement. The American Farm Bureau Federation estimates that U.S. farm exports to Colombia will increase by over $900 million per year after full implementation of the CTPA, with gains spread across a wide range of U.S. agricultural products.

Question 3
In your opinion, what will be the benefits for Mr. Chavez of a failure of Congress to pass the Colombia trade legislation?

Answer
President Uribe of Colombia has said that approval of the U.S.-Colombia FTA is the best way for the United States to demonstrate its support for Colombia, and I will say that the United States-Colombia Trade Promotion Agreement certainly has significant strategic implications for the United States. Colombia has been a steadfast democratic ally in the fight against illegal drug trafficking and terrorism. Colombia has shown a commitment to reduce poverty and increase economic growth and opportunities through free markets and greater global integration. Colombia remains committed to the rule of law and to strong, democratic institutions. Not all countries in Latin America share these same commitments. Rejecting the Colombia Agreement would send a troubling signal about the reliability of the U.S. as an ally -- a signal that would certainly be exploited by some in the region, including Venezuela whose leader has spoken out against the FTA.

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